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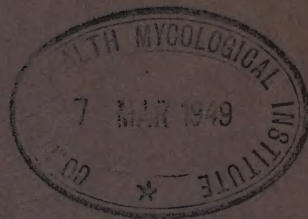
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[No. 2.]

DISEASES CAUSED BY BACTERIA AND FUNGI

MOSS, B., SQUIRE, J. R., & TOPLEY, E. (1948.)
Nose and skin carriage of *Staphylococcus aureus*
in patients receiving penicillin.—*Lancet*. 254.
320-325. [Authors' summary copied ver-
batim.] 183

Intranasal penicillin has been used experi-
mentally in a male surgical ward to test the
relationship between nose and skin carriage of
Staph. aureus in persistent carriers.

In 21 patients a 10-day course of intranasal
penicillin significantly reduced nasal carriage
during treatment. There was an associated
significant fall in skin carriage. This is taken as
strong experimental evidence that the skin was,
in these patients, contaminated from the nose.

In 15 patients systemic penicillin, under the
conditions described, did not reduce nose or skin
Staph. aureus carriage.

Special vestibular and middle-fossa nasal
swabs were taken from 34 patients. The propor-
tions of *Staph. aureus* isolated, 5 pairs of phage-
typing results and 9 nasopharyngeal swab results,
supported the hypothesis that the focus of *Staph.*
aureus colonisation was the squamous epithelium
of the nasal vestibule.

The significance of nose-to-skin contamina-
tion by *Staph. aureus* is discussed. Intranasal
penicillin may effectively reduce this contamina-
tion; but the prophylactic and therapeutic value
of intranasal penicillin in staphylococcal skin
infections will depend also on the absence of
significant contamination from other sites.

MINETT, F. C., & EDWARDS, W. P. S. (1945.)
Treatment of strangles with sulphanilamide.—
Indian J. vet. Sci. 15. 1-16. 184

Forty-eight horses affected with strangles
were treated with sulphanilamide. There were
also 48 untreated control cases of apparently equal
severity. Clinical details and temperature charts
are given. Beneficial effects consisted mainly in
a reduction of fever and probably to some extent
in the localization of abscesses. There was no

difference in the duration of hospitalization in the
two series. While the question of adequate
dosage and duration of treatment is always
important, sound clinical judgement is required
in using the sulphonamides. Thus, in outbreaks
of strangles, sulphanilamide might be used on
animals in which the disease is not running the
normally mild course. It would probably be
still more profitable to use the drug on very early
cases when fever is a pronounced symptom.

The possibility of combining sulphanilamide
treatment with improved methods of vaccination
is a matter for future research.—K. C. SINHA.

OBEL, N. (1943.) Bidrag till kännedom om
fö-lösnings-ångens etiologi och patogener,
Förelöppande meddelande. [Aetiology and
pathogenesis of parturient laminitis in mares].
—*Skand. VetTidskr.* 33. 41-49. [English
summary.] 185

In seven out of 13 cases of parturient laminitis
in mares haemolytic streptococci were isolated
from the uterus, *Bact. coli* being present in the
rest. The streptococcal infection was much the
more serious. The author considers that the hoof
disease is a hyperergic reaction to the uterine
streptococcal infection. He investigated the
histology of the laminae of the hoof and claims to
have demonstrated a peculiar kind of change,
manifested by an increase in collagen fibres in
the corium layer, and certain further changes
which are described and illustrated. This is a
preliminary paper.—J. E.

OLSON, Å. (1946.) Spirillkastning. [Spirillary
abortion in cattle and sheep in Sweden].—
Skand. VetTidskr. 36. 1-36. [Abst. from
English summary.] 186

The author isolated spirilla from the placenta,
vaginal exudate and abomasum of cows and from
the lung of a foetus. The author considers the
long, undulating spirilla to be the most fully
developed form; the cultures were incubated in a
desiccator. The spirilla were non-pathogenic for

mice and g. pigs; serological investigations were negative.

Spirillary abortion almost invariably occurs in isolated cases, although in one herd of 100 cattle five cows aborted in one year.

Irregularity in the incidence of pregnancy is occasionally found after an outbreak is apparently over, possibly an indication of persisting infection; abortion is most usual in the seventh or eighth month.

The placenta and foetus are oedematous.

The author gives an account of the examinations of placenta material sent to the State Veterinary Institute, Stockholm, during the 20 years, 1924-1943; 2,105 cases of spirillary abortion occurred, these being 10% of the total of aborted placentas. Incidence is restricted to certain districts and does not coincide with that of *Brucella abortus*. The author considers the limited distribution to be due to the character of the soil, occurring chiefly on low-lying pastures.

Six cases in sheep are described.

—E. V. L.

BASILE, A. (1940.) Ricerche sugli enzimi batterici. Nota I*—La lipasi tributirrolitica del *B. anthracis* e dei germi carbonchiosimili. [Experiments on bacterial enzymes. Note I. The tributirrolitic lipases of *B. anthracis* and allied bacteria.]—*G. Batt. Immun.* 24. 151-168. [English, French & German summaries.] 187

In tests for butyrylolytic lipase *Bacillus anthracis* gave negative results although bacteria allied to anthrax have exhibited lipase activity on butyric to a greater or less degree. Among these *B. subtilis* has a particularly active lipase; considerably lower activity is shown by *B. mesentericus vulgatus*, *Bact. megatherium* and *Bact. anthracoides*. Lipases of *B. subtilis* and *B. mesentericus* are not heat resistant; lipase of *B. subtilis* is partially resistant to quinine. Lipase activity affords a practical means of distinguishing *B. anthracis* from other aerobic sporulating bacilli.—K. J. S.

KNAYSI, G. (1948.) Preliminary observations on germination of the spores of *Bacillus mycoides* in a nitrogen-free medium and certain properties of the transparent cells.—*J. Bact.* 55. 753-757. 188

The number of spores of *B. mycoides* which can develop in a solution of glucose and acetate decreases with the age of the culture. When the spore suspension is not too old, spore germination can be enhanced by autoclaving of the glucose acetate solution immediately before use or by adding potassium phosphate. Ageing of the culture is attributed to oxidative processes.

—E. KLIENEGER-NOBEL.

MIDDLEBROOK, G., DUBOS, R. J., & PIERCE, C. (1947.) Virulence and morphological characteristics of mammalian tubercle bacilli.—*J. exp. Med.* 86. 175-184. [Authors' summary and conclusions copied verbatim.] 189

Experimental infection of the mouse can be used for the determination of virulence of cultures of mammalian tubercle bacilli. The relative virulence of such cultures for the mouse is approximately the same as for the guinea pig.

Cultures of virulent and avirulent variants of mammalian tubercle bacilli grown in the depth of Tween 80-albumin liquid medium, on the surface of solid agar modifications of this medium, and on the surface of a liquid modification of this medium exhibit consistent morphological differences. All virulent cultures tend to form microscopically demonstrable serpentine cords of varying thickness and length consisting of highly acid-fast bacilli oriented in parallel along the long axis of the cord. The formation of cords appears to be an important factor in conditioning the ability of cultures to spread on the surface of liquid and solid media. It can be inhibited by the addition to the medium of the surface-active water-dispersible oleic acid ester, Tween 80. Avirulent variant bacilli grow in a more or less non-oriented fashion. They have never been observed to form cords under any condition of growth and are much less acid-fast than the virulent cultures when grown in Tween-albumin medium.

Two strains of mammalian tubercle bacilli which are intermediate in degree of virulence between the fully virulent and the avirulent variants also exhibit intermediate morphological characteristics.

VOLKERT, M., PIERCE, C., HORSFALL, F. L., Jr., & DUBOS, R. J. (1947.) The enhancing effect of concurrent infection with pneumotropic viruses on pulmonary tuberculosis in mice.—*J. exp. Med.* 86. 203-214. 190

In these experiments two different strains of mice were employed and two different pneumotropic viruses, i.e., a pneumonia virus and an influenza A virus, were used. It was shown that the course of experimental infection with a mammalian strain of tubercle bacilli is altered by concurrent or superimposed infection with either of the two viruses. Even when very small virus inocula were administered, the tuberculous process in the mouse lung was considerably augmented. Thus it is possible to convert a mild and slowly progressing tuberculous infection into a more rapidly progressing disease by experimental means.—E. KLIENEGER-NOBEL.

HEAF, F. (1947.) B.C.G. vaccination against tuberculosis.—*Mon. Bull. Min. Hlth emerg.*

publ. Hlth Lab. Serv. 6. 184-193. 191

H. reviews the work done in Scandinavia, where BCG vaccination of human beings has proved of great value. The situation in Scandinavia is compared with that in Gt. Britain, where on account of the larger and denser population it is more difficult to deal with TB. As in Gt. Britain there are fewer facilities for the isolation of open cases, the protection of non-reactors would be the more urgent. In the three Scandinavian BCG laboratories the vaccine is prepared in two strengths, for intradermal use, and for inoculation by scarification. No vaccine more than 10 days old must be used. Tuberculin tests are carried out first 6-8 weeks before and again immediately before vaccination. Six to eight weeks after vaccination the skin test is repeated, and the patient is re-vaccinated if he has not become tuberculin sensitive. For 6-8 weeks before and after vaccination contact with TB. must be avoided. Babies of tuberculous mothers are vaccinated a few hours after birth, and not returned to their mothers until they have become tuberculin positive. Every vaccinated case is followed up closely.

BCG is prepared in laboratories devoted exclusively to this work, so that pathogenic organisms are excluded. Although the costs of vaccine preparation are low, the dispensary services required in connection with BCG vaccination are rather expensive.

By skilful and conscientious propaganda carried out along with the vaccination work BCG has become firmly established in Scandinavia, and in Norway a Bill to make it compulsory is under consideration.

The value for human beings of a vaccine prepared from the vole bacillus is being studied. The author states that in observations made on animals it has appeared to yield rather better results than BCG.—A. MAYR-HARTING.

McINTOSH, C. W., & KONST, H. (1947.) **Tuberculin.**—*Canad. J. comp. Med.* 11. 344-351. 192

[French summary.]
The early history of tuberculin is discussed and its first use in the U.S.A. The first tuberculin test on cattle in Canada appears to have been made in 1892 with German tuberculin, which was used until about 1908. A Canadian bovine strain was used until 1946 when tuberculin prepared from B.A.I. strains by their method was introduced. There was a great increase in no-visible-lesion reactors from the use of this tuberculin. Experiments with g. pigs indicated that the B.A.I. (human type) tuberculin possessed a wider antigenic range than bovine type tuberculin containing the same amount of tuberculo-protein.

Results were the same in comparative field trials in cattle. Search is being made for bovine strains which may produce a tuberculin of higher potency and, meanwhile, it has been deemed advisable to revert to the use of the bovine tuberculin previously employed in Canada, except for export animals.

—R. GWATKIN.

MACCALLUM, P. (1948.) **A new mycobacterial infection in man. I. Clinical aspects.**—*J. Path. Bact.* 60. 93-102. 193

TOLHURST, J. C., & BUCKLE, G. (1948.) **A new mycobacterial infection in man. II. Experimental investigations in laboratory animals.**—*Ibid.* 60. 102-110. 194

SISSONS, H. A. (1948.) **A new mycobacterial infection in man. III. Pathology of the experimental lesions in the rat.**—*Ibid.* 60. 110-116. 195

BUCKLE, G., & TOLHURST, J. C. (1948.) **A new mycobacterial infection in man. IV. Cultivation of the new mycobacterium.**—*Ibid.* 60. 116-122. 196

[Authors' summary (covering all four parts) copied *verbatim*.]

In a series of 6 cases of ulceration of the skin in a rural area in Australia, a mycobacterium hitherto unrecorded and pathogenic to man was found in the lesions.

The lesions are described, the relevant clinical data are recorded, and an account is given of the laboratory investigations which have been carried out.

In the three cases in which detailed laboratory studies were made, material from the ulcers infected rats and mice but not guinea-pigs. In rats characteristic lesions were produced, including ascites, cutaneous oedema and ulceration, and the disease was transferable from rat to rat indefinitely.

The organism, a strongly acid-fast mycobacterium, has been cultivated and its characteristics are described. It requires a temperature below 37° and above 25° C. for its growth (optimum about 33° C.), and in its nutritive requirements it is fastidious to a degree comparable with the tubercle bacillus.

The relationship of this disease to other mycobacterial infections is discussed, and it is concluded that the causal organism is distinct from any of the hitherto described mycobacteria.

Comment is made on certain implications of finding a new mycobacterium pathogenic to man.

SMITH, C. R. (1947.) **Alcohol as a disinfectant against the tubercle bacillus.**—*Publ. Hlth Rep., Wash.* 62. 1285-1295. [Author's summary copied *verbatim*.] 197

Alcohol is an effective disinfectant against tubercle bacilli.

Tubercle bacilli in water or sputum suspension were killed in exposure periods of 15 to 30 seconds by absolute, 95, and even 70 percent ethyl alcohol. Tubercle bacilli in smears dried from sputum or water suspensions were usually killed by 50 and 70 percent ethyl or 80 to 80 percent isopropyl alcohol in 1 to 2 minutes, sometimes in 15 to 30 seconds. In a very thick sputum smear, the bacilli survived the action of 70 percent alcohol 5 but not 10 minutes. The antiseptic action of alcohol was not reduced by the presence of sputum except where the smears were very thick. Ninety-five percent alcohol is best for wet surfaces; 50 percent for dry; and 70 percent for wet or dry.

LARSEN, A. B., & JOHNSON, H. W. (1947.) **Antigenic relationship between the genus *Mycobacterium* and the genus *Corynebacterium* in goats and cattle.**—*Amer. J. vet. Res.* 8. 184-185. 198

The experiments described were designed to determine any cross-reaction which might occur between the genus *Mycobacterium* and the genus *Corynebacterium* in cattle and goats. *Corynebact. pseudotuberculosis* was inoculated into goats which were subsequently tested with tuberculin and johnin. No non-specific reactions were observed. Further experiments to test the possible neutralization of diphtheria toxin by sera obtained from cattle previously sensitized with various species of mycobacteria, were equally fruitless.—B. W.

MORSE, E. V. (1948.) **A study of *Corynebacterium renale* and penicillin therapy in the treatment of specific pyelonephritis of cattle.** pp. 41. Thesis, Cornell. 199

Forty-three strains of *Corynebact. renale* were studied culturally, and their biochemical activities noted. The cultures were typical in their growth characteristics on most laboratory media. Two strains vigorously reduced nitrate to nitrite.

It was found that *C. renale* has a penicillin sensitivity range of 0.0039 to 0.0312 I.U. per ml. in Penassay broth at a pH of 7.2. Of the 43 strains 41 were inhibited by 0.0156 I.U. of penicillin per ml. or less.

An aqueous solution of 200,000 I.U. of crystalline sodium penicillin was given to normal cows using intravenous, intramuscular, and subcutaneous injection routes. The data indicate that the blood and urine penicillin levels were sufficiently high to inhibit the majority of *C. renale* strains for a period of 150 min. or two and a half hours using the intravenous route; 180 min. or three hours for the intramuscular injection,

and 240-270 min. or four to four and a half hours for the subcutaneous method.

The injection of 1,000,000 I.U. of calcium penicillin, Romansky formula "oil wax", subcutaneously once per day for ten days usually removes the symptoms of pyelonephritis temporarily, but recurrence is observed in the majority of cases.—H. L. GILMAN.

COLE, C. R. (1946.) **Listerellosis in a Hereford cow.**—*J. Amer. vet. med. Ass.* 109. 216-217. 200

A Hereford cow became totally blind and at the same time developed disturbance of the central nervous system. Death occurred one week after the symptoms were first noticed.

P.M. examination revealed meningitis and inflammation of the medulla oblongata. *Erysipelothrix (Listeria) monocytogenes* was isolated from the brain and pure cultures of the organism induced conjunctivitis and keratitis in a rabbit inoculated subconjunctivally.—J. I. TAYLOR.

COBLENTZ, J. M., & LEVINE, M. (1947.) **The effect of metabolites of *Escherichia coli* on the growth of *coli-aerogenes* bacteria.**—*J. Bact.* 53. 455-461. 201

Broth cultures of organisms of the *coli-aerogenes* group were warmed to 43°C. and incorporated with agar. This medium was then inoculated with members of the *coli-aerogenes* group. All organisms tested seemed to produce auto-inhibitory substances. These were specific, the greatest degree of inhibition on *coli*-staled agar being produced for *Bact. coli*, less for *Bact. freundii* (*Citrobacter*), and least for *Bact. aerogenes*. The longer the broth cultures had been incubated the more effectively did they inhibit growth.*

—A. MAYR-HARTING.

KVESITADZE, I. F. (1945.) **[Bacteriophage. An effective treatment for calf paratyphoid and colibacillosis.]**—*Veterinariya, Moscow.* No. 6. pp. 13-14. 202

K. prepared Gaertner, coli- and poly- (i.e., mixed) phages, and found that all three were equally successful in treating calf paratyphoid and infection attributed to *Bact. coli*. The patient, starved for 4-6 hours is given 25-30 ml. of 3-5% sodium carbonate solution, followed in 10-15 min. by 30-50 ml. of the phage preparation in 100 ml. of warm water. The dose is repeated three times a day at two hour intervals.

The importance of using phage of high lysing capacity is stressed. It is claimed that phage may be used both as a prophylactic measure, and as a method of diagnosis for both diseases.—L. L.

KAUFFMANN, F., & EDWARDS, P. R. (1947.) **A simplification of the serologic diagnosis of**

salmonella cultures.—*J. Lab. clin. Med.* 32. 548-558. 203

Methods for the rapid identification of *Salmonella* types in the routine laboratory are described. With a set of one polyvalent and 14 specific sera accurate identification of the more important types causing 98% of human and animal *Salmonella* infections is possible. For the recognition of the remaining 2% of organisms, material should be sent to a central laboratory for typing. The paper contains much useful advice on technical points.—A. MAYR-HARTING.

BYRNE, M. J. (1947.) *Salmonella* infection in a foal.—*Irish Vet. J.* 1. 94. 204

An acute case of enteritis in a foal is described. Pure cultures of *Salmonella typhi-murium* were recovered P.M. from spleen and liver.—A. M.-H.

SCOTT, W. M., & MINETT, F. C. (1947.) **Experiments on infection of cows with typhoid bacilli.**—*J. Hyg., Camb.* 45. 159-168. 205

In connexion with an outbreak in human beings of typhoid fever proved to be milk-borne, an investigation was carried out to study the infection of cattle with typhoid bacilli. A cow fed with large numbers of bacilli did not excrete them in either faeces or milk, and young calves excreted them only temporarily the day after they had received the feed containing typhoid bacilli. When the culture was instilled into the udder by way of the teat canal a mastitis followed with excretion of organisms, usually lasting for only a few days. Infection of an injured teat orifice did not lead to an infection lasting more than a few days, whereas other organisms, such as streptococci, tended to set up permanent infections at damaged orifices. The authors conclude that in milk-borne outbreaks of typhoid fever the possibility of an actively infected and excreting cow is negligible, but bacilli brought into the milk from an outside source multiply there very readily.

Details of the technique adopted for the execution of this important experiment on cows in stalls are given.—A. MAYR-HARTING.

RANKIN, J. D., & SLAVIN, G. (1947.) *Salmonella enteritidis* var. *dublin* infection in a cow resulting in an outbreak of human gastro-enteritis.—*Vet. Rec.* 59. 122-124. 206

SUTHERLAND & BERGER [*V.B.* 14. 400] reported an outbreak in which 162 individuals in 79 households were infected, all being supplied with milk from one farm. R. & S. carried out a bacteriological investigation of the cow found to be the source of infection; the animal was clinically healthy, and the faeces were of normal consistency. Its serum gave "H" and "O" agglutination with a strain isolated from its faeces,

The milk whey gave only a very low titre "H" agglutination and no "O" agglutination during seven months of observation. The organisms were never found in the urine or in clean milk samples, but cultures from the faeces were always positive with one exception.

The danger with regard to consumption of milk in such a case is the pollution of the milk with infected faeces. The organisms were isolated P.M. in pure culture from the bowel and from the gall-bladder which showed marked thickening of the wall, and apparently caused the carrier state in that animal.—A. MAYR-HARTING.

OLSEN, A. B. (1940.) *Paratyfus hos Sølvraeve. [Paratyphoid in silver foxes.]—Maanedsskr. Dyrlæger.* 52. 241-245. 207

Infection from food seems to occur only in the warmest months of the year. The incubation period is 24-48 hours; only cubs are attacked, rarely animals over six months old.

The most general salmonella types occurring are *S. typhi-murium* and *S. enteritidis* (Gaertner), but *S. cholerae-suis* and *S. enteritidis* var. *danysz* are also known. Mortality without treatment is stated to be 88%. Treatment consists in intramuscular vaccination of all the young animals, healthy and sick, as soon as possible with a type specific vaccine, giving two doses with an interval of a week. Before vaccination the sick animals must be isolated and symptomatic treatment introduced.—R. PETER JONES.

I. SELIGMANN, E., SAPHRA, I., & WASSERMANN, M. (1943.) *Salmonella* infections in man. An analysis of 1,000 cases bacteriologically identified by the New York Salmonella Center.—*Amer. J. Hyg.* 38. 226-249. 208

II. SELIGMANN, E., SAPHRA, I., & WASSERMANN, M. (1946.) *Salmonella* infections in the U.S.A. A second series of 2000 human infections recorded by the N.Y. Salmonella Center.—*J. Immunol.* 54. 69-87. 209

I. In the New York Salmonella Centre about 3,000 cultures were examined from 1939-1943 (excluding *S. typhi*). Of these, 1,000 came from human infections, mostly from stools. Thirty-eight types were found. *S. typhi-murium* was the commonest (87%), then members of the C group (*S. newport*, *S. cholerae-suis*) and *S. paratyphi* B. A few types were found, which had previously been isolated only from animals. In several instances when infection was diagnosed it was limited to a single person. *S. cholerae-suis* was found localized away from the intestinal tract more frequently than the other types. Undoubtedly it appears to be the most invasive organism of the group. Next to it ranks *S. paratyphi* B. Every *Salmonella* is potentially capable of producing any

symptom that any other *Salmonella* can produce. An epidemic due to *S. havana* occurred in newborn babies in Cuba.

Eighty-nine of the strains examined had been obtained from healthy carriers, including a large number of food handlers. *S. cholerae-suis* was never found in healthy carriers.

The seasonal distribution showed a minimum of cases in winter and a peak in October.

II. This study covers the period from April 1948 to December 1945. The distribution of salmonella types was very similar to that shown in the previous report; *S. typhi-murium* was again predominant and *S. newport* came second. *S. cholerae-suis* was predominantly isolated from parenteral sources and its invasive character thus confirmed. The highest fatality, 26%, was also observed with *S. cholerae-suis*. In 65% of the cases gastro-enteritis was the prevalent symptom, but most types of salmonella seem capable of producing a typhoid-like syndrome.

More than 150 strains came from non-human sources. Egg powder was found to be frequently contaminated. Mice, g. pigs, pigeons, xenopus toads kept for pregnancy tests, and dogs provided salmonella cultures. A dog was found to be infected in a family where two members were ill with a similar infection and the two others carriers. From a dead rat *S. paratyphi A* was isolated together with *S. typhi-murium*. From the blood of a sick horse, *S. typhi* was grown.

The taxonomic position of this group of organisms was discussed. The *Salmonella* group is, by physiological and antigenic characteristics, linked at many points to other enterobacteriaceae. Sharp lines of separation cannot be drawn, and in particular cases the classification of an organism within or without the *Salmonella* group may be a matter of expediency.

Methods of identification are discussed.

—A. MAYR-HARTING

CHAMBERLAIN, H. V. (1946.) **Pullorum disease and its control. Section II.**—*J. Dep. Agric. S. Aust.* 50. 198-204. 210

An article for laymen dealing with the rapid whole-blood, stained antigen test, disinfection of brooders, houses and yards, and disinfection of incubators including formalin fumigation. Pullorum disease is notifiable in South Australia and the use of pullorum antigen is controlled.—L. H.

EDWARDS, P. R., & BRUNER, D. W. (1946.) **Form variation in *Salmonella pullorum* and its relation to X strains.**—*Cornell Vet.* 36. 318-324. 211

Salmonella pullorum belongs to group D of the Kauffmann-White classification. But it was found, first by Younie and then confirmed by others, that marked serological differences exist

between the standard antigen strains and some strains obtained from infected birds. In the work now described the antigenic structure of *S. pullorum* and its variations were analysed. The structure was IX, XII₁ [XII₂], XII₃. XII₂ was missing in the standard antigen strains, whereas it was found to be present in a number of variant or "X" strains. This explains the relationship, revealed in cross-agglutination and absorption tests, between *S. pullorum* "X", *S. typhi* 0901 which contains all three components of XII, and *S. reading* containing XII₁ and XII₂, and the relationship between the standard strains, an abnormal strain of *S. typhi*, T2 described by ALMON & STOVALL (1939), and *S. paratyphi A*, all of which lack XII₂. The stability of the strains with regard to presence or absence of XII₂ was great, but in a number of recently isolated cultures both forms could be isolated, and in normal cultures variation of the content of XII₂ occurred continuously. The culture might become stabilized later in either form.

The authors consider that further consideration should be given to the type of antigen that would be most suitable for serological work on *S. pullorum* infection.—A. MAYR-HARTING.

BOND, E. W. (1946.) **Studies in pullorum disease. VIII. The possible relationship of non-specific reactions to the sensitizing influence of ingested proteins.**—*Canad. J. comp. Med.* 10. 71-73. [French summary. For previous parts, see *V. B.* 16. 424.] 212

A group of 100 New Hampshire pullets was divided into two lots. The control lot was fed throughout on a commercial laying mash diluted with sufficient scratch grains to reduce its mixed protein content to 14%. The experimental lot was fed 20% of four proteins separately for not less than 25 days, meat-meal, milk-powder, soya bean meal and fish-meal being used. Between trials the birds were fed on ordinary laying mash. Normal and variant types of *S. pullorum* antigen were employed. Reactions were principally with the latter. There was no indication of any relationship between any of the proteins fed and the occurrence of non-specific agglutinins for *S. pullorum*.—R. GWATKIN.

GWATKIN, R. (1946.) **Studies in pullorum disease. IX. Serological reactions of regular and variant types of *Salmonella pullorum*.**—*Canad. J. comp. Med.* 10. 254-267. [French summary.] 213

An antigenic difference was demonstrated in agglutination tests between the usual type of *Salmonella pullorum* and the variant type.

This was specially apparent in blood samples collected early in the infection. It was less

apparent in fowls infected artificially by parenteral routes than in those infected *per os*.

The antigenic difference between variant and normal types of *S. pullorum* was strikingly shown by cross agglutination experiments with a strain of *Proteus*.

Agglutinin absorption tests using antisera of *Proteus* and normal and variant *S. pullorum* strains further confirmed these antigenic differences.

—A. B. WICKWARE.

GWATKIN, R. (1946.) Studies in pullorum disease. X. Bacteriological examination of tissues from fowls exposed to infection with *Salmonella pullorum*.—*Canad. J. comp. Med.* 10. 277-283. [Author's summary copied verbatim.] 214

S. pullorum was recovered from pooled heart, lung and liver of 34 of 59 artificially infected chicks (57.6 per cent) that died following exposure to infection. Recovery from the first 22 was 31.8 per cent compared with 77 per cent of the last 12 birds. Twenty-six of the same group died from coccidiosis after pullorum losses had ceased. None yielded *S. pullorum* from heart, lung and liver but the organism was recovered from the ovary of 9 by plating broth cultures on brilliant green agar (30 per cent).

In a further examination of this group of birds after 6 months of age, *S. pullorum* was recovered from the ovary in 97 cases by plating broth cultures on brilliant green agar, whereas only 47 recoveries were made from the same ovaries by direct plating (48.4 per cent). Only 18 of 66 recoveries from the thymus gland were made by direct plating (27.2 per cent).

Preliminary culture in brilliant green broth followed by plating on beef infusion agar was not satisfactory as only 8 of 74 recoveries were made by this method (10.8 per cent). The organism was recovered by this method only in one instance (1.3 per cent).

Ten birds were cultured intensively and *S. pullorum* was recovered from one ovary only, although 7 had shown pathological changes in that organ. For all practical purposes, cultures of thymus gland, pericardium, ovary, oviduct, or testes and seminal ducts in the male, liver, spleen and pancreas in broth, seeded on brilliant green agar after 24 hours and incubated for 48 hours, would appear to be satisfactory. Direct plating of pooled heart, lung and liver and separate culture of intestine, on brilliant green or other selective medium would probably be sufficient for all general purposes with chicks. Recovery from males was lower. Only 23 of 79 positive birds yielded *S. pullorum* (29.1 per cent). The organism was recovered from testes in 12 birds, thymus

gland in 9, kidney in 5 and pericardium in 7.

MacConkey's and SS agar were not satisfactory for plating from plain broth cultures as they did not inhibit contaminants that had developed in the broth.

I. GWATKIN, R. (1946.) Studies in pullorum disease. XI. The effect of sulfamerazine on artificially and naturally infected chicks.—*Canad. J. comp. Med.* 10. 283-287. [French summary.] 215

II. GWATKIN, R. (1947.) Studies in pullorum disease. XII. Antigenic differences in strains of *Salmonella pullorum*.—*Amer. J. vet. Res.* 8. 204-208. [Discussion: p. 208.] 216

III. GWATKIN, R. (1947.) Studies in pullorum disease. XIII. *Proteus* antisera with special reference to the differentiation of regular and variant forms of *Salmonella pullorum*.—*Canad. J. publ. Hlth.* 38. 539-547. 217

IV. GWATKIN, R. (1947.) Studies in pullorum disease. XIV. Infection in the male and experiments on transmission to the female.—*Canad. J. comp. Med.* 10. 337-341. [French summary.] 218

V. GWATKIN, R. (1947.) Studies in pullorum disease. XV. Trial modifications of tube and stained whole blood antigens.—*Ibid.* 11. 18-24. 219

VI. GWATKIN, R. (1947.) Studies in pullorum disease. XVI. Disinfection of incubators with propylene and triethylene glycol.—*Ibid.* 11. 52-59. 220

VII. GWATKIN, R., & YOUNIE, A. R. (1947.) Studies in pullorum disease. XVII. The use of *Salmonella typhi* 0901 in test antigens.—*Ibid.* 11. 172-178. 221

VIII. GWATKIN, R. (1947.) Studies in pullorum disease. XVIII. Comparison of centrifuged and incubated tests.—*Ibid.* 11. 178-181. 222

IX. GWATKIN, R., & BOND, E. W. (1947.) Studies in pullorum disease. XIX. Examination of colonies from regular and variant form subcultures of *Salmonella pullorum*.—*Ibid.* 11. 282-289. 223

I. Following up the use of sulphonamides for pullorum disease by SEVERENS *et al.* [*V. B.* 16. 243] and by MULLEN [*V. B.* 17. 284] G. studied sulphamerazine given in the feed to chicks naturally and artificially infected with a variant strain of *S. pullorum*. The best results were obtained with levels of 2% and 1%. At 0.5% they were not so significant.

II. In further studies on the variant strain antigenic differences were further demonstrated by serum absorption tests with normal and variant type sera, and with a *Proteus* serum which showed a strong affinity for variant antigen, but not for normal antigen.

Comparisons were made of agglutination tests using normal antigens prepared from "Conference" strains 17-19-20, B.A.I. strains 4, 10 and 11, and the Younie or Variant strains No. 6 and No. 296, both by the tube and the whole blood rapid plate methods, also of mixed normal and variant antigens.

A mixed antigen for tube testing was not satisfactory and separate normal and variant antigens were used when testing by the standard tube method.

III. The author reports studies of cultures of *Proteus* organisms isolated from various sources and re-affirms the value of an antiserum designated *Proteus* I in differentiating between normal and variant strains of *S. pullorum*.

The procedure followed in producing *Proteus* antisera is described. *Proteus* I was the only one of 11 strains to stimulate agglutinins for variant *pullorum* antigen. G. pigs failed repeatedly to produce a good antiserum when inoculated with *Proteus* I strain but rabbits and fowls gave satisfactory results.

In the course of the work cultures were inoculated from swabs taken from the cloaca of 28 hens and eight cockerels that had been inoculated with organisms. No cultures of *Proteus* were obtained.

IV, V & VI. Attempts to transmit infection from *S. pullorum* infected males to females by constant contact for a period of ten months and by rotating such males between an infected and clean pen of pullets at ten-day intervals form the basis of this report. During a one-year period of observation 76 cockerels, of which 51 had been consistently negative serologically, either died or were killed for examination; *S. pullorum* was not recovered from any of these birds but pure cultures were obtained from 12 (48%) of the remaining 25, all of which had given positive serological reactions at some period during the course of the experiment.

In another experiment, *S. pullorum* was recovered from three (37.5%) of eight males which were or had been positive to the agglutination test. Infected males did not transmit infection to pullets with which they were constantly housed for ten months. The disease was not transmitted from an infected to a clean flock by using the same males in both flocks alternately for ten-day periods for ten months.

Modifications of stained whole blood antigen, and of the standard type antigen used in the tube method of testing, were tried in an effort to abolish the trace reactions encountered at times with the sera of non-infected birds. The best results were obtained with antigens prepared by

the standard methods. Very little trouble was encountered with the stained antigen prepared by the K formula of the B.A.I. The results of these experiments would suggest that any modifications in antigen are more likely to arise from the adoption of another strain or strains than from any factor in connection with the technique of production.

Growths of *S. pullorum* in broth and on agar plates in the presence of varying amounts of propylene glycol, formalin, phenol and an alkyl-dimethyl-benzyl-ammonium chloride disinfectant were compared; also the behaviour of this organism when exposed to vapours released by boiling and dropping glycol on a heated metal surface. There was no indication that spraying or evaporation from cloths of glycol had any effect on eggs or chicks nor was this method effective in sterilizing bacteriological incubators. The results indicate that propylene and triethylene glycol have not much value as incubator disinfectants, being greatly inferior to formalin combined with potassium permanganate.

VII. The results of further study of antigenic factors concerned in tests of normal and variant forms of *S. pullorum* and the possibility of finding a balance of antigenic factors less likely to give non-*pullorum* reactions are discussed.

S. typhi 0901 shown by P. R. Edwards to have the same XII₂ antigen as the variant form of *S. pullorum*, is compared in tube tests with antigen prepared from B.A.I. No. 11 normal strain, No. 296 variant strain, and *Proteus* I, a strain which stimulates a potent antiserum for variant forms of *S. pullorum*, but which is agglutinated only slightly by serum against the variant type and still less by serum against the normal type. These four antigens were employed separately, also in combinations as 296 + 11, *Proteus* + 11 and *S. typhi* + 11.

The antigen of *S. typhi* 0901 gave best results when combined with B.A.I. 11, giving fewer non-*pullorum* reactions than B.A.I. 11 or 296, but failed to detect seven of 49 serum samples picked by the normal and variant antigens and, while of scientific interest, was not considered satisfactory as a replacement for normal and variant tube antigens.

VIII. Hastening of agglutination reactions by centrifugation was compared with duplicate tests incubated in the usual manner, to ascertain whether non-*pullorum* [non-specific] reactions might be slower in developing than reactions due to *pullorum* agglutinins as is often observed in the rapid plate whole blood test. Antigens employed were a normal strain B.A.I. No. 11; a variant strain No. 296; used separately also

combined, and *S. typhi* 0901 combined with an equal amount of No. 11.

The method was not of value in eliminating slight non-pullorum reactions, the number and degree of such reactions being greater in the centrifuged than in the incubated tests.

IX. This report covers the examination of 100 cultures of *S. pullorum*, 59 of which were of the normal or XII₃ type and 41 of the variant or XII₂ type, in quest of a strain which might carry both the XII₂ and XII₃ antigenic factors in such suitable balance as to provide an antigen capable of detecting both the regular and variant forms of pullorum infection.

The cultures were examined by means of broth dilution platings on beef infusion agar and testing 50 or more colonies by the slide agglutination method, using normal and variant sera and a strong XII₂ *Proteus* serum.

The only variant forms found in the normal type cultures were a few colonies which gave a slight reaction to variant and *Proteus* sera.

The variant type cultures showed less variation forms. All colonies showing growth characteristics different from the parent cultures were subcultured and tried out as antigens. None of these, however, were found to have an antigenic range as wide as that afforded by the use of regular and variant antigens separately.—A. B. W.

MOORE, E. N. (1947.) **The agglutination test as a means of detecting fowl typhoid infection.**—*Cornell Vet.* 37. 21–28. 224

Two groups of birds infected with *Salmonella gallinarum*, one artificially, the other from a natural outbreak, were tested for agglutinins at about monthly intervals for periods varying from eight months to over one year. Birds that appeared to be healthy yielded positive agglutination reactions. In several cases the positive reactions occurred intermittently. The organisms could be isolated from some but not from all of the reactors at the end of the period of observation. They could be isolated from a fairly high percentage of eggs. Although the standard antigen of *S. pullorum* could be used to detect carriers of fowl typhoid, *S. gallinarum* antigen was more sensitive.

—A. MAYR-HARTING.

SAVEL'EV, G. S. (1944.) **[Eradication of brucellosis on large farms.]**—*Veterinariya, Moscow*. No. 5–6. pp. 14–19. 225

For the control of bovine brucellosis on the large collective farm, S. speaks of keeping reactors to the agglutination test on one special part of the farm so that they may not have opportunity to infect the other animals, and states that this method was carried out with success from 1930 to 1941. The details of the plan require to be

carefully arranged and carried out. Animals with consistently negative reactions need not be so segregated.—K. A. ALLEN.

GERSTENBERGER. (1944.) **Erfahrungen mit der Abortus Bang-Gallekulturimpfung in einigen schlesischen Rinderbeständen. [Inoculation of cattle with bile-cultured *Br. abortus*.]**—*Berl. Münch. tierärztl. Wschr.* | *Wien. tierärztl. Mschr.* January 21st. 26–27. 226

Inoculation of cattle with bile-cultured *Br. abortus* is claimed by the Behring Laboratory to have the advantage of causing only a transient positive blood agglutination titre, and as a rule no milk titre.

G. reported on tests on three different herds. In the first, 81 cows were inoculated and five others kept as controls. Blood tests were made every three months. After 21 months the number of suspicious blood titres had risen from nine to 24 and of positive titres from 24 to 41. Forty-one of the cows calved normally, 13 aborted (18 in the previous year) and 18 were still pregnant. Four out of the five controls calved normally.

In the second test, 28 inoculated animals and eight controls were used.

During a year of observation the number of positive blood titres in the inoculated animals rose from 18 to 19, the number of suspicious titres fell from five to two, and the number of the negative titres rose from five to seven. Three cows of the herd aborted, as compared with 11 in the previous year.

In the third test on 15 cows, over a period of several months, in no case did the milk acquire a positive titre as a result of inoculation.—P. SASSE.

ANON. (1947.) ***Brucella* infection in laboratory workers.**—*Brit. med. J.* Nov. 15. 780–781. 227

Two recent reports about *Brucella* infections of laboratory workers are here discussed. It is obvious that *Br. melitensis* and *Br. suis*, are very dangerous to handle in the laboratory. The disease thus contracted is usually severe and illness is followed by a long period of incapacity. As there is not yet an effective immunizing agent available, scrupulous measures for prevention of infections should be taken.—E. KLIENEBERGER-NOBEL.

LARSON, C. L. (1947.) **A serum protection test in tularemia infections in white rats.**—*Publ. Hlth Rep., Wash.* 62. 1798–1799. [Author's conclusions copied verbatim.] 228

A serum protection test against *P. tularensis* infection in white rats has been devised.

Immune sera withheld for 24 hours after administration of *P. tularensis* fail to protect white rats against infection.

Serum from patients convalescent or recover-

ed from tularaemia definitely decreases the mortality rate and increases the survival time of groups of white rats infected with *P. tularensis*.

Serums from a vaccinated human and from immunized goats and rabbits protect rats infected with *P. tularensis* but are usually less effective than human convalescent serum.

BYRNE, J. L., & ARMSTRONG, J. H. O. (1948.) **Blackleg with atypical symptoms caused by *Clostridium novyi*.**—*Canad. J. comp. Med.* 12. 155-160. 229

Two outbreaks of an alimentary tract infection of cattle caused by *Cl. novyi* (*Cl. oedematiens*) are reported. In one outbreak 21 out of 47 cattle died, in the other after the use of a biological preparation only two deaths occurred in a herd of 50 cattle.

The symptoms were at variance with those usually characteristic of blackleg. The organism *Cl. novyi* was not isolated from blood samples submitted but was found in intestines, lungs and some other tissues. The authors consider that *Cl. novyi* should be included in bacterins for use in districts where it is known to be present in the soil.—P. J. G. PLUMMER.

HARMS, F. (1943.) Die bakteriologische Unterscheidung von Rauschbrand und Pararauschbrand mit neuen Verfahren. [Bacteriological differentiation of *Clostridium chauvoei* infection from other clostridial infections of the blackleg type.]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* June 25th. 198-200. 230

To reduce contamination the pieces of muscle received were kept in methylated spirit for 24 hours. H. discussed the relative values of certain of the cultural techniques used for anaerobes. He discussed the relative features of the growth in culture media, of *Cl. chauvoei* and the other anaerobes infective for animals, the features when inoculated into g. pigs, haemolysis, the action of prontosil on growth and the splitting of aesculin.

—P. SASSE.

RYAN, F. J., SCHNEIDER, L. K., & BALLENTINE, R. (1947.) **The growth of *Clostridium septicum* and its inhibition.**—*J. Bact.* 53. 417-434. 231

The authors tried to find substances chemically related to growth factors which might have an inhibitory effect on the growth of *Clostridium septicum*. They used two strains for their study, one that was dependent on and the other independent of pantothenate. Only two of the substances examined were active, *viz.* sodium γ -hydroxy butyrate, which inhibited the pantothenate-independent strain, and taurine which inhibited the pantothenate-dependent strain. They found further that sodium salicylate inhibits growth of *Cl. septicum* in a way that suggests its

interference with the synthesis of the pantoyl moiety of the pantothenate molecule.—E. K.-N.

OWEN, C. R., LANGOHR, J. L., & BLAKELY, E. (1947.) **Adaptations of the Macfarlane lecithovitellic test.**—*J. Path. Bact.* 59. 261-266. 232

An adaptation of the Macfarlane lecithovitellic reaction is described, which has been found useful for roughly measuring the α -toxigenicity of strains of *Clostridium welchii*, and estimating α antibodies in sera.

Of 28 strains of *Cl. welchii* 25 gave readings indicating high levels of α toxin, while, with the exception of two strains of *Cl. botulinum*, 37 strains of other clostridia gave negative results. Not all of the *Cl. welchii* strains for which the described test indicated a high level of α toxin were toxic for mice; of the 15 strains which gave an early strong positive reaction 13 were, however, toxic, and no strain giving a negative reaction was toxic.—E. COTCHIN.

VISINTINI, A. (1947.) Il cane e' veramente refrattario al botulismo? [Is the dog resistant to botulism?].—*Zooprofilassi.* 2. No. 4. 7-10. 233

A sheep dog in good condition became ill after a meal of cooked blood, putrid before cooking, this being its normal diet. The third eyelid protruded, the right ear drooped, the voice became harsh. The temperature was 40.9°C. Next day it was staggering with the right forelimb helpless, intense mucoid salivation and difficulty in swallowing. On the third day it became recumbent and died after biting and licking the left forearm incessantly till it bled. During the three days it passed no urine and defaecated only once in response to a purge. Botulism was diagnosed from the clinical signs. No laboratory work was done to confirm the diagnosis.

—R. MACGREGOR.

EMMONS, C. W., BELL, J. A., & OLSON, B. J. (1947.) **Naturally occurring histoplasmosis in *Mus musculus* and *Rattus norvegicus*.**—*Publ. Hlth Rep., Wash.* 62. 1642-1646. [Authors' summary copied *verbatim*.] 234

Histoplasmosis was found in 1 mouse and 10 rats trapped in Loudoun County, Va. The diagnosis was proved in these spontaneously infected animals by isolation of typical strains of *Histoplasma capsulatum* in culture and its demonstration in tissue sections. Blastomyces was recovered from one mouse.

BEVERIDGE, W. I. B. (1946.) **The action of antimony and some other bacteriostatic substances on *Donovania granulomatis* isolated in the chick embryo.**—*J. Immunol.* 53. 215-223. 235

With two strains of *D. granulomatis*, the organism of granuloma venereum of man, described and named by ANDERSON, DE MONTREUX and GOODPASTURE (1945) and ANDERSON, GOODPASTURE and DE MONTREUX (1945) [not to be confused with the virus disease of man, lymphogranuloma inguinale], growth was obtained in the yolk sac and later in the yolk fluid of chick embryos. There were none of the organisms in smears from the eggs of the primary passage, but they were present in eggs of the second passage when opened 6-10 days after inoculation. Many of the organisms grown in eggs differed considerably from those in lesions, leading to some doubt as to their identity. A description of the organisms is given, it being noted that intranuclear cysts may occur both in lesions and in the yolk sac. Endermal injections of early passage material into the perineum of sheep, goats, pigs and a cow failed to produce lesions.

Tests were made on the sensitivity of the organism to various antimony compounds, and to penicillin, sulphadiazine, proflavine, propamidine and podophyllin resin. Trivalent antimony (tartar emetic, anthiomaline or fouadin) was found to be inhibitory at a dilution of 1:20,000,000 to 1:50,000,000, whilst ten times as much pentavalent antimony (neostam or sodium stibogluconate) was required to produce the same effect.

A single injection of 200 units of penicillin per egg completely suppressed growth for three days, but moderate growth occurred by the ninth day. The other compounds had little or no inhibitory effect.

The action of antimony was bacteriostatic, and evidence was obtained that thioglycollic or ascorbic acids interfered with its action. The adverse action of bacterial infection on the response to antimony treatment may be due to substances produced by the bacteria.—U. F. R.

CHEN, S. C. (1945.) [The results of curative treatment by Salvarsan against the bovine pleuro pneumonia.]—*Chin. J. Anim. Indust.* 3. 12-22. 236

Eighty-seven cases are recorded of bovine contagious pleuro-pneumonia which were treated under all sorts of conditions with intravenous

injection of salvarsan or arsenobenzol or arsenobillon. The death rate was 49.4% for the treated cows in comparison with 68.74% for the untreated. The most effective dosage was a total of 0.6-0.65 g. per 5 kg. body weight, administered in two injections with an interval of 5-7 days.—S. J. C.

LEVINTHAL, W. M. (1946.) The problem of bacterial variability and the origin of infectious disease.—*Edinb. med. J.* 53. 429-443. 237

A review of the relation of variability of bacteria and viruses in relation to pathology and epidemiology.—W. M. HENDERSON.

FOSTER, J. W., & WYNNE, E. S. (1948.) The problem of "dormancy" in bacterial spores.—*J. Bact.* 55. 623-625. 238

The so-called "dormancy" of bacterial spores is mostly due to the inhibitory effect of a fatty acid contained in the media. It is counteracted by the addition of starch.—E. K.-N.

CURRAN, H. R., & EVANS, F. R. (1945.) Heat activation inducing germination in the spores of thermotolerant and thermophilic aerobic bacteria.—*J. Bact.* 49. 335-346. 239

From the examination of 12 strains of thermotolerant organisms, isolated from spoiled processed canned milk, it was found that preheating to a sublethal temperature resulted in freer germination of the spores, i.e., the effect of the preheating is to activate the spores. The proportion of spores activated varied with the amount of heat, the medium in which they were preheated, the temperature of sporulation and the temperature of subcultivation. The preheating media in order of effectiveness in activation were glucose or lactose—peptone—skim milk—glucose nutrient agar—beef extract—glucose nutrient broth—distilled water—0.5% NaCl. Glucose was most effective in a 0.1% solution while solutions of NaCl stronger than 0.5% inhibited activation. In skim milk at 95°C. activation was nearly complete in ten min. and complete in 30 min. The response to preheating was greater when the temperature of subcultivation was suboptimal and the preheating lowered the minimum temperature of germination even if it was so drastic that few spores survived.—ALAN A. WILSON.

See also absts. 319 (*Corynebact. pyogenes* in rhinitis); 261 (mixed streptococcus and influenza infections); 330-333 (antibiotics); 347 (bacteria in meat); 352 (*Ratibacillus*); 355 (bacteria in air); 356 (*Pseudomonas pyocyanea* in semen of bulls).

DISEASES CAUSED BY PROTOZOAN PARASITES

DE KOCK, G., DU TOIT, R., & KLUGE, E. (1947.) Problems confronting the nagana campaign in Zululand.—*J. S. Afr. vet. med. Ass.* 18. 105-119. 240

The authors sketch the history of anti-tsetse

measures and tsetse dispersion in Zululand. The main species of tsetse, *Glossina pallidipes*, is mainly zoophilic and can maintain itself on small game, in contrast to *G. morsitans* which is both homophilic and zoophilic and closely associated

with large game. *G. brevipalpis* occurs on the Zululand border and from time to time disperses southwards, and pupae casings of *G. austeni* have been collected in the Morrisvale area.

Very little was known of tsetse in Zululand till after 1887 when game preservation began, and early observations indicated that the tsetse population and dispersion were largely correlated with the numbers and dispersion of game. During 1938 the tsetse control position appeared to have improved as a result of the use of Harris traps, but an increase commenced in 1941, and in 1943 a campaign was undertaken based on the elimination of host animals, discriminative bush clearing, and barrier clearings. A further "recrudescence", however, occurred in 1945, and the use of insecticides such as D.D.T. has been explored from 1945 onwards.

The value of these measures is questioned, and they are discussed in relation to the local conditions. It is argued that the unprecedented spread of tsetse to the extreme limits of the potential flybelt, and even beyond in 1946, cannot be attributed to undue migration of game as the result of D.D.T. spraying and game destruction measures.

It is claimed that the increase of bush throughout the fly belt has widened the dispersion area, and barrier clearings have not progressed enough to control it. Attention is drawn to the evidence that tsetse populations fluctuate through a long-term cycle, and it is pointed out that this spread "seems to have been universal throughout South Africa", similar dispersion being recorded in Southern Rhodesia, Bechuanaland and Portuguese East Africa.—U. F. RICHARDSON.

STIRNIMANN, J. (1947.) *Trypanosoma theileri* bei einer Kuh. [*T. theileri* infection in a cow in Switzerland.]—*Schweiz. Arch. Tierheilk.* 89. 140-141. 241

T. theileri was found in large numbers in blood and liver smears from an emergency slaughter case at Lucerne, Switzerland. The symptoms had been:—distressed breathing, rapid pulse and cessation of lactation, rumination and defaecation, but no fever. The posterior surface of the udder was smeared with blood, and the rectum contained blood-stained faeces and blood clots. Subcutaneous, submucous and subserous haemorrhages, and similar haemorrhages into the substance of the liver, kidney and spleen were revealed P.M.—U. F. RICHARDSON.

CURASSON, G., & MORNET, P. (1942.) Etude experimentale de "Trypanosoma vivax-cazal-boui" chez les petits animaux de laboratoire. [*Trypanosoma vivax* infections in laboratory animals.]—*Bull. Serv. zootech. Epiz. A.O.F.*

5. 9-15.

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Previous records of the successful infection of laboratory animals are discussed, and infections of rats, g. pigs, hamsters and monkeys are recorded. Rats and hamsters suffered a sub-acute infection ending in death. In g. pigs the disease was similar, but not usually fatal. In monkeys infection was chronic, with only the rare appearance of trypanosomes, and without disturbance of health.

—U. F. RICHARDSON.

FULTON, J. D., & STEVENS, T. S. (1945.) The glucose metabolism *in vitro* of *Trypanosoma rhodesiense*.—*Biochem. J.* 39. 317-320. 243

With *T. rhodesiense* from mice, freed from plasma and red cells by centrifugation and washing in glucose-Ringer solution, followed by suspension in buffered Ringer solution containing 0.6% glucose, the products of metabolism were found to be succinic, pyruvic, lactic, acetic and formic acids, glycerol, ethanol and carbon dioxide.

The methods used for the detection of the various products are described, and attention is drawn to the formation of large amounts of succinic acid, which was about 40% of the acids extracted. The possible mode of formation of succinic acid and of some of the other substances is discussed.—U. F. RICHARDSON.

PRÜGELHOF, F. (1947.) Erfahrungen über Beschälseuche der Pferde und ihre Behandlung mit Neosalvarsan und Mapharsen. [*Dourine in horses—treatment with neosalvarsan and mapharsen.*]—*Wien. tierärztl. Mschr.* 34. 458-471. 244

Fifty-six mares served by an infected stallion were examined in an outbreak of dourine. Including the stallion, 26 animals had definite clinical signs. Thirteen animals were suspected of infection, and 18 were apparently healthy. All of 30 blood samples sent for laboratory tests were reported as positive, but amongst them were three from pregnant mares which were not treated, and yet bore healthy foals and remained clinically healthy themselves. It is concluded that blood tests are unreliable and should only be used in confirmation of clinical diagnosis. Thirty-eight animals, of which 30 were undoubtedly affected, were treated with neosalvarsan (nearsphenamine) or mapharsen by two intravenous injections at an interval of 24 hours, the dose being, approximately, neosalvarsan 8.5 g. and mapharsen 0.3 g. per 100 kg. There were no severe reactions. One treated mare aborted following a fall, and one animal died from unexplained causes after the second dose of mapharsen. Seven months after treatment all the animals were clinically healthy, and all blood specimens were negative, including the three untreated mares. It is suggested tha-

in view of the reliability of treatment, recovered stallions might be allowed to continue service.

—U. F. RICHARDSON.

GUILHON, J. (1942.) Traitement de la leishmaniose canine par le para-aminophénylstibinate de méthylglucamine. [Treatment of canine leishmaniasis with the *p*-aminophenyl stibinate of methylglucamine.]—*Bull. Acad. vét. Fr.* 15. 68–73. 245

Treatment of five cases of canine leishmaniasis with *p*-aminophenyl stibinate of methylglucamine is recorded. Twelve to 22 injections were given intramuscularly or intravenously at intervals of two days, commencing with doses varying from 0.2 g. to 0.75 g., with a gradual rise to final doses of 1.25–1.5 g., given intravenously. The intramuscular injections and low initial doses were used for weak animals with long-standing infection, many of which had been previously treated with other antimony preparations. Although some of the animals had toxic symptoms, vomiting and depression with these low doses, they all tolerated the large doses given intravenously at the end of the course of treatment.

All the animals made a clinical recovery, and in two which were kept under observation for 10 and 28 months respectively, there was no clinical evidence of relapse.—U. F. RICHARDSON.

PIERCE, A. E. (1947.) The demonstration of an agglutinin to *Trichomonas foetus* in the vaginal discharge of infected heifers.—*J. Comp. Path.* 57. 84–97. 246

The author records his results in the diagnosis of trichomoniasis using a test developed from one originally used by Fleming for testing lysozyme and by Robertson for trichomonads. Briefly, vaginal mucus diluted with glucose saline is mixed with 2 ml. nutrient agar, poured into small petri plates and allowed to solidify. A suspension of living trichomonads is added to the surface of the plate. The degree of agglutination is recorded as in the serum agglutination test.

A specific agglutinin present in the vaginal mucus is shown. No evidence of agglutins was found in non-infected or immunized animals.

On return of oestrus the mucus associated with that phenomenon was found not to contain agglutinins or in a very low concentration. Some correlation was found between the vaginal mucus antibody and the serological response [see *V. B.* 18. 199].—W. R. KERR.

I. SPRINCE, H., & KUPFERBERG, A. B. (1947.) The nutrition of protozoa. I. A simplified medium for the investigation of unknown factors in blood serum essential for the sustained growth of *Trichomonas vaginalis*.—*J. Bact.*

53. 435–439. 247

II. SPRINCE, H., & KUPFERBERG, A. B. (1947.) The nutrition of protozoa. II. The separation of human blood serum into two fractions, both essential for the sustained growth of *Trichomonas vaginalis*.—*Ibid.* 53. 441–447. 248

I. A detailed account is given of the preparation of stock solutions and the compounding of a final medium from these stock solutions in order to obtain a culture fluid which would enable serum fractions to be tested rapidly, which could be made up quickly, which would be complete with regard to serum or serum fractions, and whose composition was well defined from a chemical standpoint. The original basal medium of Johnson and Trussell was modified so that it was suitable for the assay of unknown growth factors in blood serum necessary for the continued growth of *T. vaginalis* in pure culture. Difco peptone was replaced by trypticase and a mixture of vitamins of the vitamin B complex, purines and pyrimidines replaced the liver infusions. Acetate, asparagine, ascorbic acid, bicarbonate and ribose were added. Growth was less in 48 hours in tryptican culture fluid, but was sustained through 60 serial transfers. The organisms were found to be larger, more motile, and more uniform in shape in the trypticase medium.

II. Little is known of the factors in blood serum required for the continued growth of parasitic flagellates. The authors separated human blood serum into two fractions, one soluble and the other insoluble in ether, both of which are necessary for the sustained growth of *Trichomonas vaginalis* in trypticase basal medium. Early experiments indicated that linoleic acid is one of the active components of the ether-soluble fraction and serum albumen is one of the active components of the aqueous ether-insoluble phase.

—C. HORTON SMITH.

LEVINE, P. P. (1947.) Histomoniasis in a kidney of a turkey.—*Cornell Vet.* 37. 269–270. 249

Typical lesions of histomoniasis were found in the caeca and liver of two dead turkeys sent in for examination. A sick, four-month-old bird received at the same time was sacrificed and identical lesions were found, but, in addition, the kidneys were found to contain numerous, round, white spots about 1 mm. in diameter. Sections were cut and stained and examination revealed areas of cellular infiltration. In the centre of these areas necrosis was present and the tubules and glomeruli had disappeared. The parasites, which were assumed to be *Histomonas meleagridis* on account of their similarity to those in liver sections were distributed both singly and in large masses

within the necrotic areas. Invasion of the kidney with *Histomonas* was previously recorded by TYZZER (1920).—C. HORTON SMITH.

I. DAVEY, D. G. (1946.) The use of avian malaria for the discovery of drugs effective in the treatment and prevention of human malaria. I.—Drugs for clinical treatment and clinical prophylaxis.—*Ann. trop. Med. Parasit.* 40. 52–78. 250

II. DAVEY, D. G. (1946.) The use of avian malaria for the discovery of drugs in the treatment and prevention of human malaria. II. Drugs for causal prophylaxis and radical cure or the chemotherapy of exo-erythrocytic forms.—*Ibid.* 40. 453–471. 251

I. The multiplication of the erythrocytic forms of human malaria parasites produces clinical symptoms, and the control of clinical symptoms is therefore the chemotherapy of these forms.

A description is given of tests of 15 drugs, including mepacrine, quinine, paludrine and pamaquin, for antimalarial activity against *Plasmodium gallinaceum* in chicks, and some of these substances against *Pl. lophurae* in chicks and *Pl. cathemerium* in canaries.

In these tests a standardized number of parasitized corpuscles is injected intravenously and treatment given *per os* twice daily. The assessment of activity is made by comparing the density of infection in treated and untreated birds when the peak of the parasitaemia curve is reached. Active substances are assayed to a critical dose region, which allows an approximate minimum effective dose (M.E.D.) to be calculated. The upper limit of this region is approximately the lowest dose of the substance exerting what is materially its maximum effect, and the lower limit is approximately the lowest dose exerting a measurable effect. This is the region where the response to treatment is very markedly influenced by a slight change in the size of the dose.

The approximate M.E.D. dose for 50 g. chicks for mepacrine and quinine was 2 mg., for paludrine 0.25 mg., and for pamaquin 0.1 mg.

The various factors which may influence the activity of a drug are discussed, and a description is given of the attempts made to evaluate them. It is pointed out that different species of malarial parasites differ in their sensitiveness to drugs, and valuable drugs might be discarded if they are tested against only one species for which they may be inactive. For this reason drugs inactive for *Pl. gallinaceum* were also tested on *Pl. lophurae* and *Pl. cathemerium*, before discarding them as unlikely to be valuable in human malaria.

II. Certain observations on the life cycle of *Plasmodium gallinaceum* in the chick following the

injection of sporozoites are recorded, and experiments on the value of mepacrine, pamaquin (plasmoquin), paludrine and certain sulphonamides as causal prophylactic agents in infections with *Pl. gallinaceum*, *Pl. cathemerium* and *Pl. lophurae*. Following the inoculation of sporozoites of *Pl. gallinaceum*, parasites appeared in the blood of chicks 36 hours later, and were continuously present afterwards. During the "negative blood phase" parasites could be recovered from the solid tissues.

The course of infection with *Pl. gallinaceum* in six-day-old chicks following intravenous injection of sporozoites is described, together with the method of using the infection in testing substances for action against exo-erythrocytic forms.

The most important chemotherapeutic results obtained were that mepacrine and quinine did not appear to have any action against exo-erythrocytic forms. Paludrine could be used to protect chicks completely against infection with *Pl. gallinaceum* provided treatment was commenced before the fourth day after the inoculation of sporozoites. If given later the infection was controlled, but cure was not obtained. Similarly, cure was not obtained in infections produced by the inoculation of infected blood, although the blood stream could be kept free from parasites. This raises the questions as to whether later generations of exo-erythrocytic forms, and such forms derived from the erythrocytic parasites, may not differ from the primary forms and react differently to drugs. Plasmoquin has a slight action against the exo-erythrocytic forms of *Pl. gallinaceum*. Paludrine appears to prevent infection of chicks and canaries inoculated with sporozoites of *Pl. lophurae*, but has only a mild inhibitory action against the exo-erythrocytic forms of *Pl. cathemerium* in canaries.

Sulphadiazine and sulphamethazine were also capable of curing sporozoite-induced infections of *Pl. gallinaceum* in chicks, and several other sulphonamides caused marked delay in the course of infections, but they acted more slowly than paludrine. These drugs had no action against the exo-erythrocytic forms of *Pl. cathemerium*.

—U. F. RICHARDSON.

BRUMPT, E. (1946.) Grande utilité de deux hématozoaires aviaires, *Plasmodium gallinaceum* Brumpt 1935, et *Plasmodium lophurae* Coggeshall, 1938, pour l'étude théorique et pratique du paludisme-humain. [The usefulness of two avian haematozoa *Plasmodium gallinaceum* Brumpt 1935, and *Plasmodium lophurae* Coggeshall, 1938, in the study of malaria in man.]—*C. R. Acad. Sci., Paris.* 222. 207–208. 252
Attention is drawn to the progress made in

the study of malaria since the receipt of a strain of *Pl. gallinaceum* from Crawford in Ceylon in 1936. This progress has been possible because fowls are much more suitable as experimental animals than small birds, such as canaries. This parasite develops so readily in *Aedes aegypti* (*Stegomyia fasciata*) that the study of sporogony in the mosquito has also been facilitated. From Paris strains of *Pl. gallinaceum* have been sent to the laboratories of Europe, Palestine, Brazil, Mexico, and recently a strain has been sent from Mexico to the United States, where importation had previously been prohibited. It was with this organism that James and Tate (1937) demonstrated the exo-erythrocytic stage in the life history.

Pl. lophurae originally isolated from a Borneo pheasant in New York Zoo has also proved useful for experimental purposes as it can be maintained in ducks. This parasite causes only a very mild infection in fowls, and there is no cross-immunity between it and *Pl. gallinaceum* which will not infect ducks.—U. F. RICHARDSON.

MARKOV, A. A. (1944.) [Prophylaxis of piroplasmosis in animals moved from place to place on foot.]—*Veterinariya, Moscow*. No. 4. pp. 5-8. 253

Attention is drawn to the losses which may occur in moved stock owing to piroplasm infections, and it is urged that before such movements are undertaken a study should be made, with the help of local veterinary surgeons, of the tick distribution and the prevalence of piroplasms in the area of origin, along the route to be taken, and in the area of reception. A brief account is given of the principal characters of the various *Piroplasma* infections in Russia and the control measures which can be adopted in respect of moved animals.

In horses the areas of *Babesia caballi* and *B. equi* infection approximately coincide, although the *B. equi* infection may occur outside the recognized zones as it may be transmitted by *Dermacentor marginatus*. Moved horses should be examined weekly for ticks and any found should be destroyed. Insecticides such as pyrethrum and sodium arsenite can be used. Temperatures should be taken daily. Trypanblue can be used as a prophylactic for *B. caballi*, being given six to seven days after ticks are discovered and it is recommended that temperatures should be taken daily and trypanblue administered as soon as the first animal develops fever. No prophylactic for *B. equi* infection is known, and measures are reduced to tick destruction and treatment of cases as they occur. Trypanblue and acriflavine are recommended for *B. caballi*, and acriflavine and sulphonamide 55 for *B. equi*.

In cattle, infections may be due to *Babesiella* [*Babesia*] *bovis*, *Piroplasma* [*Babesia*] *bigemina* and *Françaiella colchica* [*B. major*?], the first transmitted by *Ixodes ricinus* and the second by species of *Boöphilus* and *Rhipicephalus bursa*, and in some areas by *Haemaphysalis punctata*. For control measures the clearing, cultivation and re-sowing of pastures is recommended for *Ixodes*, and the clearing of pastures and closing them in rotation for a year at a time for *Boöphilus*, combined with the use of sodium arsenite. For treatment albargin, ichthargan, acriflavine, piroplasmin and naganin are recommended for *B. bovis*, and for *B. bigemina* the same with the addition of trypanblue, and for *F. colchica* acriflavine or piroplasmin (acaprin).

Theileria annulata infection of cattle is also dealt with, being transmitted by *Hyalomma detritum* and *H. savignyi*. The infection is confined to southern Russia, and is most prevalent from June to August. The control measures recommended consist of the destruction of ticks on stock during movement, and after movement placing them on pasture not used by infected cattle during the preceding ten months. Tick-proof stalls should be provided with a channel, guarding the entrance, filled with mineral oil. Hay should have been stored for six months. Tick destruction should be carried out as for piroplasmosis. For treatment piroplasmin and acriflavine are recommended, sometimes combined with adrenalin or arecoline, and are said to give relatively good results if used early.

In sheep a large piroplasm *P. ovis* [*B. motasi*] and two small forms *Babesiella ovis* and *Françaiella ovis* [*Babesia ovis*] are described, transmission being by *Rh. bursa*, the majority of infections being due to the small forms. Infections are commonly complicated by an anaplasmosis transmitted in some areas by *Dermacentor silvarum* and in others by *Haemaphysalis otophila*. For control measures movement of semi-nomad sheep to mountain pastures is recommended, and for sheep kept on farms similar measures to those recommended for cattle, using acriflavine and piroplasmin for treatment.—U. F. RICHARDSON.

CORDIER, G., & OUNAIS, A. (1946.) Traitement de la theilériose bovine par des médicaments antipaludiques de synthèse. [Treatment of bovine theileria infection with synthetic antimalaria drugs.]—*Bull. Soc. Path. exot.* 39. 351-354. 254

The results are given of the treatment of 36 cattle infected with *Theileria dispar* [*Theileria annulata*] with a mixture of quinacrine [mepacrine] and rodoprequine [rhodoquine], and as the supply of the latter drug became exhausted, of

seven cattle with quinacrine alone. The dose, consisting of 3 g. quinacrine dissolved in 0.2 g. rodoprequine liquid, was given subcutaneously on three consecutive days. Subcutaneous injection caused serious swelling and sometimes necrosis, whilst intravenous injection caused death in two cases. Of the animals treated with the mixture 25 recovered out of 26. When the third dose consisted of quinacrine six animals recovered out of seven. When rodoprequine was omitted from

See also abstr. 382 (studies on bovine piroplasmosis. A text-book).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

TODD, F. A. (1947.) Status of foot-and-mouth disease vaccination in Europe. [Correspondence.]—*J. Amer. vet. med. Ass.* 110. 300. 255

A correction to a report that Switzerland was the sole source of effective F. & M. disease vaccine in the world. [See *J. Amer. vet. med. Ass.* (1947.) 110. 50.]—W. M. HENDERSON.

SCHOLL-LATOUR, O. (1946.) Behandlung der Maul- und Klauenseuche beim Tiere mit Sulfonamiden. [Treatment of foot and mouth disease with sulphonamides.]—*Dtsch. tierärztl. Wschr.* 53. 88–91. 256

Seven cows, three pigs, ten piglets and one sheep with F. & M. disease were treated with a mixture of four sulphonamides consisting of equal parts of marfanil [4-amino methyl benzene sulphonamide] marfanil-B, prontalbin and eleudron [sulphathiazole], administered both externally as a powder and internally in solution; recovery was claimed to be rapid and complete in every case. Since in certain cases vesicles on the teats healed without rupturing, with re-absorption of the contents, it is suggested that the sulphonamides appeared to act not only on the secondary infections but on the virus itself.—E. V. L.

SHAHAN, M. S., KNUDSON, R. L., SEIBOLD, H. R., & DALE, C. N. (1947.) Aujeszky's disease (pseudorabies). A review, with notes on two strains of the virus.—*N. Amer. Vet.* 28. 440–449. 257

SHAHAN, M. S., KNUDSON, R. L., SEIBOLD, H. R., & DALE, C. N. (1947.) Aujeszky's disease (pseudorabies). A review, with notes on two strains of the virus.—*Ibid.* 28. 511–521. 258

The authors review the literature on Aujeszky's disease and transmission experiments are described with two strains of the virus originating from a cow and a calf. Rabbits, chickens, pigeons, mice, g. pigs and pigs all proved susceptible to inoculation of virus by various routes. The rabbit proved to be the most suitable laboratory animal for diagnosis and passage of the virus.

the last two injections only one animal recovered out of three and when rodoprequine was omitted from all three injections only two animals recovered out of seven treated. Deaths had occurred before treatment in the herds from which the treated animals were drawn, but no information is given as to the local natural mortality, nor were untreated controls included in the experiment.

A shrivelling of the parasites is claimed to result from the treatment.—U. F. RICHARDSON.

Attempts to transmit the disease by contact between infected and healthy rodents all failed. Calves in close contact with infected pigs remained healthy. These in-contact animals subsequently proved susceptible to inoculation of virus.

In swine temperatures up to 105.8°C. were recorded three to five days after inoculation. No evidence of pruritis was seen in any of the inoculated pigs. Trembling and chorea were seen in some pigs, but in others the only response was an intermittent febrile reaction.

Attempts to vaccinate rabbits using formolized brain tissue vaccines were not successful. Rabbits, showing early local irritation after inoculation were anaesthetized with nembutal without any apparent effect on the course of the disease. Exposure for 30 minutes to 55°C. in a water bath inactivated the virus. In two trials the virus proved infective after being held at 3–5°C. for 34 and 70 days. The histopathology of the disease in various animals is described. The difficulties of accurate diagnosis in swine are discussed and the suggestion is put forward that the disease should be made notifiable.—D. LUKE.

LEVADITI, C. (1945.) Virus rabique fixe et negrigenèse. [Negri bodies in white mice infected with "fixed rabies virus"].—*C. R. Soc. Biol. Paris.* 139. 573–574. 259

Examination by a modification of MANN's fixation and staining method [LEVADITI, C. (1945)] of the brains of mice infected with fixed rabies virus revealed Negri bodies, the presence of which in this case had been hitherto unsuspected. Their number and size varied considerably from mouse to mouse and although they were occasionally similar to those seen in mice infected with street virus, they were not usually so abundant or so big.—W. M. HENDERSON.

CORFINI, F. (1942.) Ricerche sull'azione dell'acido ascorbico nella influenza sperimentale. [The action of ascorbic acid in influenza induced experimentally.]—*G. Batt. Immun.* 28. 540–541. [English, French & German

summaries.]

Subcutaneous injection of ascorbic acid into mice conferred no immunity against influenza virus infection.—K. J. SINCLAIR.

WILSON, H. E., SASLAW, S., DOAN, C. A., WOOLPERT, O. C., & SCHWAB, J. L. (1947.) **Reactions of monkeys to experimental mixed influenza and streptococcus infections. An analysis of the relative roles of humoral and cellular immunity, with the description of an intercurrent nephritic syndrome.**—*J. exp. Med.* 85. 199–215. 261

Monkeys were inoculated in the following ways: (a) with influenza virus A and haemolytic streptococci group C simultaneously, (b) with virus A followed later by streptococci, (c) with inactivated virus followed by active virus plus streptococci, (d) with streptococci followed by virus A, (e) previously inoculated animals were reinoculated with streptococci and virus. Symptomatic, haematologic and immunologic studies were made on the inoculated animals. It was shown that virus infections may predispose to secondary bacterial invasion and that under unfavourable circumstances (e.g., malnutrition, physical cold) the infection may become overwhelming.—E. KLIENEBERGER-NOBEL.

GRATZL, E. (1947.) **Die Pferdegrippe. [Influenza in horses.]**—*Wien. tierärztl. Mschr.* 34. 566–579. 262

In a general account of the equine influenza complex of diseases, G. refers to the virus infection now usually called infectious bronchitis, and the modifications of this disease due to secondary bacterial infection by streptococci and paratyphoid bacteria (*Salm. abortus equi*). These bacteria are often present together and cause serious disease, incrimination of the latter bacteria being a recent war-time observation in Germany by STITZ and GRÖKEL [see *V. B.* 12. 368].

The clinical types of equine influenza are differentiated into the "virus catarrh", catarrhal-purulent inflammation of the upper respiratory tract, bronchitis and broncho-pneumonia, septicaemia and anaemia respectively. Methods of treatment are outlined: specific chemotherapy with sulphonamides is of course directed against streptococcal infection.—J. E.

SULKIN, S. E., GOTH, A., & ZARAFONETIS, C. (1946.) **Influence of anesthesia on experimental western equine encephalomyelitis.**—*Science*. 104. 53–54. 263

Three groups of Swiss mice three to four weeks old were inoculated intracerebrally under light ether anaesthesia with an approximately $3 \times LD_{50}$ dose of western equine encephalomye-

litis virus. Group I, 39 mice, received no further treatment and 92.4% died. Group II, 31 mice, were given three four-hour periods of diethyl ether anaesthesia during the first 36 hours after injection and only 58.1% died. Group III, 30 mice, were given two four-hour periods of anaesthesia beginning at the time the first signs of encephalitis developed and only 60% died. Besides this lower mortality in the anaesthetized groups there was also some delay in the development of symptoms.—W. M. HENDERSON.

PATTISON, I. H. (1946.) **Observations on bovine malignant catarrh in Palestine.**—*J. comp. Path.* 56. 254–265. 264

Rabbits, g. pigs, rats and mice were inoculated with filtered and unfiltered material from two fatal cases of bovine malignant catarrh. Three rabbits developed malignant catarrh out of nine inoculated intraperitoneally with citrated bovine blood collected during the febrile period of the disease. The clinical signs and P.M. findings in these three rabbits are described in detail. One further passage was made from one rabbit to three others, two of which were believed to become affected. A detailed description is given of the histological examination of the liver, kidney, spleen, lymph nodes, brain and cervical cord of fatal bovine "head-and-eye" cases.—W. M. HENDERSON.

COCKBURN, A. (1947.) **Infectious enteritis in the zoological gardens, Regent's Park.**—*Vet. J.* 103. 261–262. 265

Infectious enteritis is the cause of considerable mortality among the Felidae at the London Zoo. Since 1929 5 tigers, 17 leopards, 8 wild cats, 2 lynxes, 2 servals, 4 leopard cats, 7 tiger cats, 6 ocelots, 1 eyra cat and 4 cheetahs have died from it. Penicillin therapy has been used, the dose being 50,000 units per 100 lb. body weight every three hours day and night for three days and thereafter every three hours during the day until the animal recommences to eat. Of animals so treated, 6 leopards, 2 cheetahs and 1 ocelot survived and 2 leopards, 2 wild cats, 2 cheetahs and 1 ocelot died. The difficulty of adequately disinfecting an animal's cage was shown by the occurrence of the disease on two occasions when fresh arrivals were housed in a cleaned cage that had previously contained an infected animal.

—W. M. HENDERSON.

Hsu, T. D., CHANG, S. M., YANG, S. N., & LO, C. S. (1946.) **[Immunization against fowl plague.]**—*Chin. J. anim. Husb.* 6. 11–14. 266

In tests of the potency of different fowl plague vaccines, it was found that glycerin-formalin treated nervous tissue vaccine, glycerin-formalin treated spleen vaccine, and formalin treated crop

fluid had no protective power. Serum prepared from a goose failed to protect fowls.—S. J. C.

WALKER, R. V. L. (1948.) **Newcastle disease.**
—*Canad. J. comp. Med.* 12. 171-176. 267

The presence of the virus of Newcastle disease in Canada was established by its recovery in eight outbreaks. Diagnosis was based on the isolation of the virus in embryonating eggs and confirmed by the haemagglutination-inhibition test. Representative birds from 50 farms where the infection was suspected were examined.

—R. GWATKIN.

VAN ROEKEL, H., SPERLING, F. G., BULLIS, K. L., & OLESIU, O. M. (1948.) **Immunization of chickens against Newcastle disease.**—*J. Amer. vet. med. Ass.* 112. 131-132. 268

A field strain of Newcastle disease virus which failed to induce symptoms when injected intramuscularly into six chickens was selected for vaccination trials.

Live egg-propagated virus of this strain was applied by the stick method, *i.e.*, puncture of the web of the wing by mounted needles.

In a preliminary trial 36 chickens, 9-25 weeks old, were vaccinated. All chickens developed an inflammatory reaction at the site of inoculation within 48-120 hrs., this reaction disappearing by the eighth to the tenth day. Systemic reactions were noted in some chickens and one developed nervous symptoms. Fourteen of the chickens were resistant when challenged with virulent virus 29-78 days after vaccination.

In a field trial 11,600 chickens were vaccinated by this method. No respiratory or nervous symptoms were noted but there was a decline in food consumption and egg production.—F. D. A.

REAGAN, R. L., LILLIE, M. G., POELMA, L. J., & BRUECKNER, A. L. (1948.) **Modified Newcastle virus vaccines.**—*Amer. J. vet. Res.* 9. 220-224. 269

Newcastle disease virus passaged intracerebrally through hamsters showed a decreasing pathogenicity for chickens. Infected hamster brain suspensions were successfully used to immunize chickens. Hamster-adapted virus failed to produce symptoms when injected by several routes into *Rhesus* monkeys.—F. D. A.

JUNGHER, E. (1948.) **Report of the committee on modes of spread of Newcastle disease.**—*J. Amer. vet. med. Ass.* 112. 124-125. 270

The average mortality amongst 46,375 chickens, 1-35 days old, affected with Newcastle disease was 11.4%; in 46,200 chickens, 42-120 days old, 5.8%; and in 58,460 fowls, 150-420 days old, 1.5%. In the latter group loss of egg production amounted to 80%.

N.d. virus was isolated from the air sacs and spleen of a chicken 19 days after artificial infection and from the faeces 11 days after infection. Chickens placed in an uncleaned pen two weeks after the removal of sick fowls developed antibodies without the appearance of symptoms. Chicks hatched from eggs, laid by hens 60 days after recovery from N.d. remained normal. Susceptible chickens placed in contact with hens 60 days after recovery remained normal.

N.d. virus remained viable on non-sterile burlap strips for more than 20 days at 29°-72°F. On sterile burlap the virus remained viable for 13 days at 29°F., for 25 days at 51°F. and for 55 days at 72°F.—F. D. ASPLIN.

MOSES, H. E. (1948.) **Report of the committee on Newcastle virus properties.**—*J. Amer. vet. med. Ass.* 112. 126-127. 271

A brief review of Newcastle disease virus and its properties. Disinfection with sodium hydroxide has given variable results. Virus has been detected after exposure to 2% NaOH for 1 hr. at room temperature.

Quaternary ammonium compounds, sodium hydrochloride and calcium hydrochloride appear to be promising disinfectants for this disease.

Formalin fumigation at 85°-90°F. with high humidity destroyed the virus within 24 hours. The minimum time for destruction was not ascertained.—F. D. ASPLIN.

BAKER, H. R., & HAYS, T. A. S. (1947.) **Observations concerning Newcastle disease in Delaware.**—*Proc. 19th Ann. N.E. Conf. Lab. Wkrs Pullorum Dis. Contr., June 11th, 12th & 13th.* pp. 26-27. [Mimeographed.] 272

Newcastle disease was first diagnosed in Delaware in December 1945. Since then 25-38 outbreaks a month have been diagnosed by H.I. test.

The average mortality in 147,000 birds in 14 infected flocks of young growing stock was about 18% but varied 1-65%.

In young chicks respiratory symptoms were intense and mortality averaged 30%. The disease usually terminated in about ten days with little tendency towards chronicity. In older chickens the symptoms tended to be chronic and to resemble infectious coryza. Nervous symptoms were less frequent than in younger chicks.

H.I. tests on 100 breeding flocks showed 44 to be positive. Respiratory disease with fall in food consumption and egg production and egg quality, had been noted in 36 of the positive flocks during the previous six months.—F. D. A.

JUNGHER, E. L., & TERRELL, N. L. (1948.) **Naturally acquired passive immunity to infec-**

tious bronchitis in chicks.—*Amer. J. vet. Res.* 9. 201-205. 273

A technique for a quantitative serum neutralization test for infectious bronchitis in embryonated eggs is described. Owing to the low initial titre of egg-adapted bronchitis virus, the virus was used undiluted and in low dilutions mixed with an equal volume of test serum or yolk extract.

Tests on embryonated eggs from an immunized flock showed that during the second half of the incubation period antibody declined in the yolk and increased in the serum and tissues of the embryo.

Chicks hatched from immunized parent stock maintained antibody at a high level for the first two weeks but had lost it by the fifth week. Chicks infected at five weeks of age developed

See also absts. 190 (pneumotropic viruses in mice); 202 (bacteriophage); 282 (interference phenomenon in distemper); 326 (equine encephalomyelitis).

antibody which was maintained at a high level.—F. D. ASPLIN.

BEAUDETTE, F. R., MILLER, B. R., BIVINS, J. A., & HUDSON, C. B. (1948.) **The viability of dried viruses of avian origin.**—*Amer. J. vet. Res.* 9. 190-194. 274

Egg-adapted viruses of avian origin dried from the frozen state and stored in an evacuated desiccator at refrigerator temperature were tested for viability.

Activity was maintained by one strain of laryngotracheitis for 3359 days, and by a second strain for 927 days; fowl pox, 3598 days; pigeon pox, 3605 days; canary pox, 2571 days; turkey pox, 1468 days; infectious bronchitis, 684 days. Two bronchitis-like viruses maintained activity for more than 3,000 days.—F. D. ASPLIN.

IMMUNITY

BLACKLOCK, D. B. (1945.) **Metazoan immunity.**—*Lancet.* 248. 84 & 85. 275

Commencing with his own discoveries in West Africa in 1923 on the immunity of man to reinfection of the skin by the larvae of *Cordylobia anthropophaga*, B. refers to subsequent important contributions in the study of immunity to metazoan parasites, urging British workers to investigate along these lines.

An immunity has been proved experimentally to develop against attacks of *Cordylobia* larvae not only in man but also in animals.

The development of such an immunity in cattle in similar forms of myiasis is considered a possibility and worthy of investigation.—J. F. A. S.

MOORE, T. (1948.) **The effects of exsanguination on the agglutinin content of the blood.**—*Canad. J. comp. Med.* 12. 96. 276

Variations in the serum titre of cattle partially exsanguinated were not significant by rapid and tube agglutination tests or by the complement-fixation test.—P. J. G. PLUMMER.

BURNET, F. M. (1948.) **The basis of allergic disease.**—*Med. J. Aust.* Jan. 10th. 29-35. 277

A discussion on the immunological activities of the body which give rise to allergic disease, their clinical manifestations and treatment, and the genetic aspects of allergy.—N. WICKHAM.

GUGGENHEIM, K., & BUECHLER, E. (1947.) **Nutritional deficiency and resistance to infection. The effect of caloric and protein deficiency on the susceptibility of rats and mice to infection with *Salmonella typhi murium*.**—*J. Hyg., Camb.* 45. 103-109. 278

An account of an investigation of the effect of either or both caloric and protein deficiency on the susceptibility of rats and mice to oral infection with *Salmonella typhi-murium* is given. The restriction of the food intake to 80% of the normal diet for a period of five weeks was without influence on the infection susceptibility of rats even when the diet was low in protein, but long term restriction of food intake led to a marked lowering of the resistance to infection, particularly if the ration was gradually reduced, this effect being independent of the protein content of the diet. In mice, on a restricted food ration, loss of resistance to *Salmonella typhi-murium* infection was found to be due to a deficiency of both calories and protein. Their susceptibility to epidemics was lessened by the supplementation of their diet with calories or protein. The authors consider that the diminution of resistance observed is brought about by a lowering of the antibody response.—MARY C. LOBBAN.

CAMERON, H. S. (1947.) **Immunologic and clinical studies on plasma fractions from domestic livestock. I. The antibody content of porcine and bovine gamma globulin.**—*Amer. J. vet. Res.* 8. 153-156. 279

The blood from which the plasma fractions tested were obtained represented a pooled sample from about 400 slaughtered pigs or cattle, collected without regard to A.M. or P.M. inspection. Many of the pigs from which the blood was obtained would at some time have been exposed to swine fever virus through vaccination, and it was found that pigs weighing 35 lb. were protected against 2 ml. of fresh virus by 4 ml. of the porcine plasma

γ -globulin fraction. The same fraction agglutinated *Br. abortus* and *Br. suis* to a titre of 1:160, while the corresponding bovine fraction gave a titre of 1:1,280; other fractions gave lower titres. The bovine and, to a lesser degree, the porcine γ -globulin fraction contained staphylococcal antitoxin.—E. COTCHIN.

LEONARD, S. L., & KURZROK, R. (1946.) Inhibitors of hyaluronidase in blood sera and their effect on follicle cell dispersal.—*Endocrinology*. 39. 85-90. 280

A method was developed for assaying the activity of hyaluronidase preparations based on their ability to disperse the follicle cells surrounding rat ova. One "rat-ova unit" of hyaluronidase is defined as that quantity of enzyme in 0.2 ml. of Ringer's solution which will disperse the follicle cells, to a degree varying from complete denudation to where not more than a single layer of follicle cells remains, of two out of three or 50% of a greater number (but not exceeding eight) of rat ova within three-quarters to one hour.

The blood serum of the following species was found to inhibit the action of bull-testis hyaluronidase:—(1) rat, chicken; (2) rabbit, horse; (3) man, King crab (*Limulus polyphemus*), and (4) cow (arranged in approximately decreasing order of inhibitory power). The action of rat-testis hyaluronidase was only slightly inhibited by these sera. Serum from rats immunized against bull-testis enzyme did not inhibit rat-testis enzyme to

a greater degree than control rat serum. Doses of 0.2 ml. of rat serum introduced into the uterine cornua of seven rats during oestrus did not prevent conception.

No increase in the quantity of inhibitor substance was found in the blood of nine sterile women.—ALFRED T. COWIE.

CITARDA, A., & CARUSELLI, M. (1942.) Fenomeno di Sanarelli-Shwartzman e tasso glicemico. [The Sanarelli-Shwartzman phenomenon and glucose level.]—*G. Batt. Immun.* 28. 179-188. [English, French & German summaries.] 281

Starting from the known relation between glucose level and anaphylactic shock, the action of glucose on the Sanarelli-Shwartzman phenomenon was studied. The experiments showed that the Sanarelli-Shwartzman phenomenon, at the point of maximum intensity, lowers the glucose level in rabbits and that the administration of glucose reduces or inhibits the phenomenon.

K. J. SINCLAIR.

CRAWFORD, M. (1947.) The interference phenomenon in relation to immunization against distemper and other virus diseases.—*Vet. Rec.* 59. 39-41. 282

A short review illustrated by the classic examples of the phenomenon introduces a description of Green's use of a ferret-passaged strain of canine distemper virus in the prevention and treatment of distemper in dogs [see *V. B.* 16. 223].—W. M. HENDERSON.

See also absts. 191 (BCG); 192 (tuberculin); 224 (agglutination test in fowl typhoid); 246 (agglutinins in trichomoniasis); 266 (fowl plague); 268 and 269 (Newcastle disease); 273 (infectious bronchitis in fowls).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

ERLICH, I. (1942.) Mallophaga kokoši. [Mallophaga of the domestic fowl.]—*Vet. Archiv.* 12. 397-406. [Abst. from German summary.] 283

Mallophaga species isolated from 100 fowls of varying age and sex were:—*Menopon gallinae* in 39, *Uchida pallidula* in three, *Eomenacanthus stramineus* in seven, *Menacanthus cornutus* in 12, *Gonioides dissimilis* in one, *Goniocotes gigas* in four, *Goniocotes hologaster* in four, *Lipeurus caponis* in five and *Gallipeurus heterographus* in three. A key based on Hohorst (1939) and Neveu-Lemaire [*V. B.* 8. 829] is provided for identifying the species.—K. J. SINCLAIR.

GASCHEN, H. (1944.) Variations saisonnières des Tsétsés. [Seasonal variations in tsetse flies.]—*Bull. Soc. Path. exot.* 37. 250-256. 284

A study has been made of the relationship between the concentration of tsetse flies in French West Africa and Togoland, and climatic factors. Maximum temperatures occur in April and

maximum relative humidity occurs in August, minimum relative humidity occurring some weeks before maximum temperatures. For *Glossina palpalis* the seasonal concentration curve follows the relative humidity curve until maximum rains are reached and then the curve drops rapidly. The larvae of *G. palpalis* inhabit places covered by dense vegetation and such places are warmed up only very slowly, causing late increases in numbers. Maximum rains, however, swamp and kill many pupae, thus accounting for the sudden drop in the concentration curve. In *G. tachinoides*, an inhabitant of conifer regions, maximum concentration occurs before maximum temperatures. A sandy soil covered with groves of pines gives only a slight protection from the sun, and the exposure is sufficiently strong to cause increased concentration to occur before maximum temperatures, when relative humidity is at a minimum. The lack of moisture is compensated by the supply of subterranean water to the pupae.

G. palpalis is a hygrophilic species whereas *G. tachinoides* is a xerophilic species. In discussion on the paper it was pointed out that *G. tachinoides* has greater temperature tolerance than *G. palpalis*, but as far as humidity is concerned the two species are similar; that no observations have been made on the microclimate relationships of the larvae of *G. tachinoides*; that the varying humidity of the seasons constitutes a factor in the migration of the tsetse fly, especially in the case of *G. tachinoides*; that a dry season causes them to abandon large parts of the territories which they frequent in a humid season; that an apparent swarming maximum may thus be obtained from concentrations of larvae developed in temporarily favourable areas; that the conclusion could not, however, be drawn that *G. tachinoides* thrives better in a dry season.—BERYL A. THURSTON.

KEMPER, H. E., ROBERTS, I. H., SMITH, C. E., & COBBETT, N. G. (1947.) **DDT dips for the control of sheep keds, *Melophagus ovinus*.**—*J. Amer. vet. med. Ass.* **111**. 196-199. 285

In seven tests involving over 5,000 sheep in New Mexico and Colorado, U.S.A., single dipping in oil-and-water emulsions or aqueous suspensions containing 0.2% D.D.T. eradicated ked infestations in flocks. Single dipping in oil-and-water emulsions containing 0.15% D.D.T. failed to eradicate keds in two out of four tests. Xylol (but not benzol) may be used as a D.D.T. solvent. Kerosene and heavy petroleum oils used in small quantities in the D.D.T. oil-and-water emulsions appeared to cause little or no discomfort to the sheep.—L. DAVIES.

ROBERTS, R. (1946.) **Benzene hexachloride for animal parasites.**—*J. econ. Ent.* **39**. 589. 286

See also *absts.* 240 (tsetse fly); 253 (ticks and piroplasmiasis); 329 (DDT).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

LAPAGE, G., BLAKEMORE, F., & WORTLEY, W. H. (1947.) **Treatment of fascioliasis of cattle and sheep with a suspension of hexachlorethane and bentonite.**—*Vet. Rec.* **59**. 176-177. 289

OLSEN [*V. B.* **14**. 40] recommended a preparation containing hexachlorethane one lb., bentonite one and a half oz., white flour one-quarter teaspoonful, tap water 25 fl. oz.

He recommended six and a half fl. oz. for adult cattle and half this amount for calves of three months.

Fourteen emaciated cattle were treated and egg counts were made before and after treatment. The cattle were housed during the experiment, and as they were very weak only half the recommended dose was given. Five animals were dosed once only and nine animals received two doses

Two or three teaspoonsfuls of crude benzene hexachloride dust rubbed into the coat of a dog cleared a heavy infestation with the dog flea, *Ctenophalides canis*, within four hours. Lone star ticks (*Amblyomma americanum*), located on the ears of one dog were treated with a pinch of the dust; the ticks ceased feeding immediately and died within 12-16 hours.—L. DAVIES.

SINEV, A., SALT'YKOV, F., & GOL'MOV, V. (1945.) **[Kimai—an old-time remedy against mange in sheep.]—*Veterinariya, Moscow*. No. 6. pp. 31-33.** 287

"Kimai"—an emulsion in water of an oil derived from sheep dung, has long been popularly used for the treatment of mange. In laboratory tests a 10% emulsion killed the mites in 5-10 min., and this was well within the time taken for the material to evaporate from the sheep.

The authors describe how to obtain the material in quantity from collected sheep dung.—L. LEVENBOOK.

BUSHLAND, R. C. (1946.) **New Guinea field tests of uniforms impregnated with miticides to develop laundry-resistant clothing treatments for preventing scrub typhus.**—*Amer. J. Hyg.* **43**. 230-247. 288

Clothing impregnated from solutions or emulsions of 5 acaricides, at 2-2½ ounces per uniform, were found to protect the wearers from "chigger" attack. Benzyl benzoate and dibutyl phthalate still gave protection after two cold-water launderings. Dimethyl phthalate failed to withstand one cold laundering. Diphenylamine caused discomfort when clothing impregnated with it pressed tightly against the skin.—L. DAVIES.

eleven days apart. Eight out of the nine cattle dosed twice gave negative egg counts after treatment but one month later only two of the nine were negative, indicating that the flukes had not been eradicated.

Twelve sheep in poor condition and all passing fluke eggs were given 15 g. of hexachlorethane. Egg counts six to seven days after treatment showed that eight out of the 12 were not passing fluke eggs. After 27 days nine out of the 12 sheep were still negative. No toxic effects were observed in any of the experimental animals.

The authors consider that the best results will follow dosing during the autumn and again in the early months of the year.

—D. LUKE.

COLE, G. (1945.) **The Australasian Hydatid Registry.**—*Hlth Bull., Melb.* July-Dec. Nos. 88/84. 2255-2261. 290

The register is housed at the Royal Australasian College of Surgeons in Melbourne. The collection of recorded cases of hydatid disease in man in Australia and New Zealand was begun in 1930. By 1945 there were some 1,800 entries. C. extracted relevant data for Victoria, giving the numbers of cases in various municipalities, age and sex distribution, history of association with dogs and general comments. A table provides data on the location of cysts in Australian, Victorian, and New Zealand cases.—H. McL. G.

CRAIGE, A. H., Jr. (1947.) **Teniasis as a cause of running fits. A clinical report.**—*N. Amer. Vet.* 28. 94-95. 291

C. refers to the old theory that intestinal irritation, nutritional interference or toxin production set up by the presence of tapeworms in dogs may cause hyperaesthesia and the paroxysms designated as running fits. He gives case records of eight dogs, five with running fits, two with hyperaesthesia, and one having posterior incoordination, in which the administration of a taeniicide gave immediate clinical improvement and allayed the symptoms, although no attempt was made to ensure that the worms had been expelled.—J. O. L. KING.

TAYLOR, E. L. (1947.) **The ecology of nematodes parasitic in farm animals.**—*Vet. Rec.* 59. 624-625. 292

The various factors involved in the host-nematode parasite relationship are discussed. The importance of the still little-known mechanism by which the numbers of parasites are limited to levels compatible with a reasonable state of health is emphasized. The influence of the grazing habits of different herbivores on the acquisition of parasites is mentioned. The circumstances altering the host-parasite relationship are enumerated and the importance of the resistance mechanism in the adult host is stressed.—D. LUKE.

DINABURG, A. G. (1945.) **The effect of low outdoor temperatures on the free-living stages of some common nematode parasites of sheep.**—*Amer. J. vet. Res.* 6. 257-263. 293

By a series of experiments involving the exposure of eggs of *Cooperia curticei*, *Oesophagostomum columbianum*, *Ostertagia circumcincta* and *Trichostrongylus* spp. to winter conditions in Maryland, U.S.A., it was concluded that the pre-infective stages of *Cooperia*, *Trichostrongylus* and *Oesophagostomum* are unlikely to survive the months of December, January and February in locations with similar climatic conditions, but that those of *Ostertagia circumcincta* would survive

unless the temperature was sustained below freezing for long periods. It is pointed out that if sheep, infected with *Cooperia*, *Trichostrongylus* and *Oesophagostomum* were removed from pastures before or during the occurrence of a 14-day cold period in which the mean-maximum temperature falls below 42°F. and the mean minimum below 29°F., recently deposited pre-infective stages would be killed in two weeks. If, however, the sheep remained on the pasture, eggs would eventually be deposited which would develop in the spring into infective larvae. D. discusses the different susceptibilities of these nematodes and points out that in making comparisons of temperature in different regions the other physical factors of the locality must be taken into consideration.

—J. F. A. SPRENT.

DIKMANS, G. (1945.) **Two new lungworms, *Protostrongylus gracilis* and *Varestrongylus sinicus* (Nematoda: Protostrongylinae), from sheep and goats in China.**—*J. Wash. Acad. Sci.* 35. 294-296. 294

This is a description of two new lungworms found in the bronchi and lung tissues of sheep and goats in China. There is no information as to pathogenicity.—D. LUKE.

CHRISTENSEN, N. O., OLSEN, S. J., & ROTH, H. (1946.) **Incidence of lungworms and gastrointestinal parasites in Copenhagen cats.**—*J. Parasit.* 32. 514-515. 295

Of 250 cats three harboured *Aleurostrongylus abstrusus* and four, *Capillaria aerophila*. The former caused lung lesions in all cases, but the latter caused bronchitis in only two cases.

Of 130 cats the incidence of helminth parasites was as follows: *Ollulanus tricuspis* in 13 cases; *Capillaria putorii* in one; *Ancylostoma caninum* in two; *Toxocara cati* in 67. Of another series of 100 cats *Taenia taeniaeformis* was present in seven. Of 20 further cats *Cryptocotyle lingua* was present in six; *Cryptocotyle concava* in one.

The oocysts of *Isospora rivolta* were found in four cats and those of *Isospora felis* in seven cats out of 130. Parasites were absent from the bladder and diaphragm of 100 cats. Comparison with a previous survey in 1866 revealed the absence of *Dipylidium caninum* which was formerly common, but no change in the incidence of *Taenia taeniaeformis* and *Toxocara cati*.

A. abstrusus, *O. tricuspis*, *C. putorii*, *A. caninum* and *C. concava* have not previously been found in Denmark. *C. lingua* has not previously been reported in cats.—J. F. A. SPRENT.

POPA, M. (1947.) **Sopra una epizoozia di oftalmia verminosa delle bovine in Moldavia, Bessarabia e Transnistria. [Ocular thelaziasis**

in cattle in Roumania.]—*Clin. vet., Milano.*

70. July-August. pp. 98-103. 296

P. describes the general habits of the worm *in situ* and the complications it may cause to the eye and related structures.

In some areas 60% of the cattle are attacked. No prophylactic agent is yet known, but the intermediate host is believed to be an aquatic arthropod.—R. MACGREGOR.

VARIČAK, T., & ERLICH, I. (1944.) O načinu učvršćenja i prehrane jednog pripadnika Echinostomidae u kolonu pure. [Attachment and feeding of an echinostome in the colon of a turkey.]—*Vet. Arhiv.* 14. 137-142. [German summary.] 297

An observation on *Echinostoma revolutum* and of the local lesion in the mucous membrane of the intestine of the host.—K. J. SINCLAIR.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

ROSKIN, G. I., & STRUVE, M. E. (1947.) Differential cytophysiological diagnosis of cancerous and normal tissues.—*Stain Tech.* 22. 83-86. [Authors' abstract copied *verbatim*.] 298

A method is offered for the differential diagnosis of cancer cells. It depends on the use of methylene blue decolorized with sodium thiosulfate (denoted here HLM, *i.e.*, "hyposulfite methylene blue"); this is prepared by dissolving 800 mg. sodium thiosulfate in 10 ml. of 0.1% aqueous methylene blue and adding 3-5 drops of dilute (1:3) HCl. Frozen sections are treated with this reagent for 2-3 minutes, rinsed with a large amount of distilled water, then stained 2-3 minutes with 0.05% aqueous acid fuchsin. Staining should be performed in a darkened room. If all due precautions are observed, normal tissue appears blue, malignant tissue red.

OPIE, E. L. (1947.) Cytochondria of normal cells, of tumor cells, and of cells with various injuries.—*J. exp. Med.* 86. 45-54. [Author's conclusions copied *verbatim*.] 299

Bodies that may be designated *cytochondria* occupy the greater part of the cytoplasm of the normal and tumor cells that have been studied. They are characterized (a) by their behavior as discrete particles with surface properties that cause osmotic changes in the presence of water; (b) by reactions to stains which show that they have a rim surrounding a clearer (lipoid) center; (c) by their varying relation to the basophilic substance (ribonucleic acid) of the cytoplasm.

Mitochondria which have characteristic reactions to stains promptly lose their distinctive reactions in the presence of solvents or as the result of pathological changes, becoming apparently indistinguishable from other cytochondria.

Changes that occur in cytochondria give insight into the pathogenesis of a variety of pathological lesions. Hydropic swelling of cytochondria caused by chloroform, butter yellow, and other agents, representing one variety of parenchymatous degeneration or cloudy swelling,

results in changes similar to those following the immersion of fresh tissues in water.

When parenchymatous cells undergo fatty degeneration as the result of injury fat accumulates within cytochondria.

LANSING, A. I. (1947.) Calcium and growth in aging and cancer.—*Science.* 106. 187-188. 300

This is a survey of the present state of knowledge on changes in intracellular calcium as an important factor in both ageing and malignancy.

An increase with age in the calcium content of the periphery of the cell has been noted by previous workers in both plants and animals. Possibly this decreases permeability and may be a factor in senescence. L. has shown that rotifers in a low calcium medium live longer than controls and also that experimental removal of calcium from the cells of the rotifer by sodium citrate increases longevity. It has been shown with various insects and tadpoles that semi-starvation increases longevity by extending the growth period and comparable results have been obtained with rats.

It appears that cessation of growth is a critical point in the initiation of age changes.

Cancer tissues are markedly low in calcium and it appears that the base-binding capacity of an organic factor which binds calcium is altered in cancer.

L. considers that an organic calcium-binding complex of the cell cortex plays an integral part in the growth regulatory mechanism of cells and when growth ceases this complex is altered in such a way as to increase calcium-binding capacity. When this does not occur the state of affairs associated with cancer is brought about.—M. C.

GALY, P., BAUD, C. A., & DUPREZ, A. (1947.) Prolifération épithéliale bronchique intra-alvéolaire (adénomatoses et cancer). [Intra-alveolar proliferation of the bronchial epithelium (adenomatosis and cancer).]—*Bull. Histol. Tech. micr.* 24. 175-179. 301

This is a short discussion of a pulmonary condition in which epithelium of the type normally covering the large bronchi, is found lining the alveoli. It may be cubical or cylindrocubical, but is not provided with cilia, and it occurs in one layer only.

Two human cases of the condition are described, one of which appeared to be cancerous in type, the other of simple inflammatory origin and comparable with the lesions of Jagsiekte in sheep, or the adenomatosis described by American authors.—I. W. JENNINGS.

MCCLELLAND, R. B. (1947.) **Treatment of multiple round-cell sarcomas of the skin in dogs.**—*J. Amer. vet. med. Ass.* **111.** 112. 302

The author treats single round cell sarcomas of the skin by excision, freezing with ethyl chloride or by X-ray therapy. Three cases of multiple round cell sarcomata of the skin were treated with neoarsphenamine given intravenously. The dosage ranged from 0.27 g. to 0.5 g. and appeared to be related to the time interval between successive doses.—A. R. JENNINGS.

REWELL, R. E. (1947.) **Tubular adenoma of the**

testis and oestrogenic activity.—*J. Path. Bact.* **59.** 321-324. 303

A description of a tubular adenoma of the testis of a dog associated with an oestrogenic type of hypertrophy of the prostate. Clinical signs included pigmentation and alopecia of the abdomen.—A. R. JENNINGS.

DAVIS, O. S., DOYLE, L. P., WALKEY, F. L., & CENKER, L. K. (1947.) **Studies in avian leukosis III. The incidence of avian leukosis in various breeds of chickens.**—*Poult. Sci.* **26.** 499-507. [For previous parts, see *V. B.* **17.** 372.] 304

The P.M. records of 13,669 fowls examined in Indiana during a 12-year period show that 34% (4,750 cases) had some form of leucosis. The average incidence of visceral leucosis was higher in Barred Plymouth Rocks than in White Rocks, Rhode Island Reds or White Leghorns. The average incidence of neural and ocular lymphomatosis combined was highest in White Leghorns and lowest in Barred Rocks.

The figures indicate that there has been only a slight decrease in leucosis in all breeds during the period surveyed.—F. D. ASPLIN.

NUTRITIONAL AND METABOLIC DISORDERS

ELLIS, N. R. (1943-1947.) **New ideas in feeding.**—*Yearb. U.S. Dep. Agric.*, 1943-1947. pp. 95-106. 305

War-diet changes concerned all species of livestock and one species was compared with another to discover which was the most economical in producing food for human consumption from the available feeding stuff.

In this way barley could be reserved for human use by partially replacing it with additional hay in feeding fattening steers. Soya beans and urea are discussed as possible substitutes and results are given in regard to pigs and herbivores respectively.

E. discusses recent advances in knowledge of the mineral and vitamin requirements of livestock. Short notes are included on phosphorus requirements, cobalt and trace element deficiencies. Fluorine poisoning is mentioned. There is a short discussion on urinary calculi formation. Vitamin requirements are discussed, especially those of pigs in respect of the various components of the vitamin B complex. Riboflavin deficiency as a possible cause of periodic ophthalmia in horses is also mentioned.—A. H. HOGG.

STAPLES, C. H., & SEATH, D. M. (1942.) **Feeding and management of dairy calves.**—*Bull. La agric. Exp. Sta.* No. 342. pp. 16. 306

A short account for the practical breeder on

the rearing of Holstein and Jersey dairy calves. The results of experimental work are given, illustrated by tables, on rearing on varying diets, the data covering records over several years. Although the emphasis is on the young calf, records of diet are given until first calving. The authors are mainly concerned with the amount and type of milk or milk substitute which can be fed to yield economically sound results. The most liberal feeding producing the largest heifer is not necessarily the most economical. In fact the standard diet adopted by the Louisiana University Herd and suggested as the most economical does not produce the largest calf. Feeds for older calves and heifers are discussed, *e.g.* silage, grain, hay, etc., and well established rules in respect of hygiene and stabling are given.—A. H. HOGG.

CONVERSE, H. T. (1947.) **Advances in feeding calves.**—*Yearb. U.S. Dep. Agric.*, 1943-1947. pp. 159-168. 307

Milk substitutes used in calf rearing are discussed. C. describes experiments which support the view that whole milk can be satisfactorily substituted by skim milk, in dairy breeds practically from birth, colostrum being given for the first few days. He states that calves may be weaned on skim milk at two months instead of at six months but this condition should be governed by the price of skim milk. In this way 8 lb. of

butter per calf reared could be saved for human use. Calves must be trained to eat hay and grass at 10-12 days old for weaning at two months. With the addition of cod liver oil to skim milk calves could be reared on this diet alone without any additional energy supplements. To produce results comparable with those obtained on whole milk rearing an energy supplement must be added to skim milk. Maize meal, flaxseed jelly, or grain is added to the milk. If weaned at two months the supplements are fed in warm water. A supplement of vitamin D is unnecessary. A calcium supplement is unnecessary if timothy or alfalfa hay is fed but necessary when feeding with grass hay. The grain mixture should have a high protein content.

The feeding of scour-prevention capsules, containing vitamins B and C, did not reduce the incidence of scours. Sulphaguanidine or sulphathiazole fed at the rate of 2 g. daily from 2-3 days old until 30 days old reduced the incidence of scours.—A. H. HOGG.

NICHOLS, R. E. (1947.) **A note on the comparison of gases from spontaneous and rumen fermentation of certain feedstuffs.**—*Amer. J. vet. Res.* 8. 391-395. 308

The results of about 1,400 determinations of gases produced *in vitro* by spontaneous fermentation of various feeding stuffs are summarized in graph form. The feeding stuffs used included: alfalfa hay, ground maize, a 35% protein concentrate, young grass, and hay. Some of these were also fed to a cow, and the gas contents of the rumen analysed.

Methane was absent from the gases formed *in vitro*, whether the feeding stuffs were inoculated with fresh rumen content or not. There was a low percentage of hydrogen in the rumen gas, while it was present in greater amounts in the gases produced *in vitro*, particularly by those feeding stuffs with a relatively high protein content.

—E. COTCHIN.

FORBES, E. B., ELLIOTT, R. F., SWIFT, R. W., JAMES, W. H., & SMITH, V. F. (1946.) **Variation in determination of digestive capacity of sheep.**—*J. Anim. Sci.* 5. 298-305. 309

The authors used sheep to find the digestible nutriment of dried forage. They wished to discover the number of sheep which would be required to cover the variability of individual determinations which arise in such work from factors such as parasitism, faults in technique, etc. Twenty-five Merino sheep were confined in digestive crates for 20 days. They were fed on hay alone but it was found that although of good quality it was not sufficient to keep up the weight of the sheep. Preliminary treatment was given with a

mixture of phenothiazine and bentonite, the results of subsequent worm counts being satisfactory. The collection of the faeces was made by means of a special harness and faecal bag. Tables of the hay analysis and the statistical results arising from the tables of the coefficients of digestibility, digestible nutrients and metabolizable energy of the hay are set out and discussed in detail. From all of which it appears that five sheep per experiment are a sufficient number for usual purposes.—A. H. HOGG.

WYKOFF, M. H. (1946.) **Nutritional requirements of the dog. Discussion of foodstuffs—vitamins and minerals.**—*Vet. Student, Iowa.* 8. 228-230. 310

A compilation of published opinions and experiments on the feeding of dogs.—T. H. F. TASH, L. H., & JONES, J. M. (1947.) **Phosphorus. Experiments show this mineral essential to greater beef production in South Texas.**—*Texas vet. Bull.* 9. No. 8. 1 & 3-6. [Reprinted from *Cattleman*, Feb., 1947.] 311

This is a description of long-term experiments beginning in 1938 with range cattle on the well-known King Ranch in South Texas, a phosphorus-deficient area. The phosphorus content was found to vary considerably in the different types of herbage, with the stage of development of the grass and the type of soil in the area. Very few samples contained 0.13% phosphorus which is given as the maintenance level for a 1,000 lb. cow (20 lb. of dry matter containing 0.13% phosphorus yields 12 g. of phosphorus which is the maintenance level). Mowing increases the phosphorus content by allowing the short succulent grass to predominate whereas drought produces tall coarse grass with a low phosphorus content. The protein content naturally varies similarly and symptoms of phosphorus deficiency are often complicated by those of protein deficiency. A 1,000 lb. cow requires 17 g. of phosphorus per day to meet minimum needs.

The well-known symptoms of phosphorus deficiency are discussed.

In an experiment extending over several years 100 heifers were divided into four groups, one being a control. The other three groups were fed supplements of (a) bonemeal, (b) disodium phosphate and (c) bonemeal + a trace element supplement respectively. In those animals fed bonemeal or disodium phosphate development and fertility rate were normal whereas the control group developed all the usual symptoms of aphosphorosis. The addition of a trace element supplement produced no significant effect in the results.

Methods for giving a suitable phosphorus

supplement are discussed, feeding bonemeal, treatment of pasture with superphosphate or adding disodium phosphate to the drinking water.

—A. H. HOGG.

UNDERWOOD, E. J., ROBINSON, T. J., & CURNOW, D. H. (1947.) **The manganese content of Western Australian cereal grains and their by-products and of other poultry feeds.**—*J. Agric. W. Aust.* 24. 259-270. 312

The manganese content of a large number of Western Australian grown wheats and their by-products, bran and pollard, and of oats, barley, maize, meatmeal and green plants was determined. Mean Mn content of over 200 samples of wheat in 1940-41 season was 37 p.p.m., range 19-84 p.p.m., with 65% of samples 30-44 p.p.m. Oats contained a mean of 43 p.p.m., barley 15 p.p.m., and maize only 8.6 p.p.m. Meatmeal averaged 20 p.p.m., range 11-25 p.p.m., lucerne (nine samples) 9-67 p.p.m., *Pennisetum purpureum* (six samples) 17-110 p.p.m. on dry basis.

When bran and pollard comprise a portion of the ration, Mn content should be adequate for growing and laying fowls in Western Australia. With "whole grain" feeding, Mn should be adequate when wheat and/or oats constitute the bulk of grain fed. When barley and/or maize constitute 50% or more of the ration a manganese supplement should be added.—L. HART.

I. RUBIN, M., & BIRD, H. R. (1946.) **A chick growth factor in cow manure. I. Its non-identity with chick growth factors previously described.**—*J. biol. Chem.* 163. 387-392. 313

II. RUBIN, M., & BIRD, H. R. (1946.) **A chick growth factor in cow manure. II. The preparation of concentrates and the properties of the factor.**—*J. biol. Chem.* 163. 393-400. 314

I. The growth factor for chicks in cow

See also absts. 278 (influence on immunity); 300 (calcium and cancer); 318 (riboflavin and periodic ophthalmia); 334 (copper content of lens in cattle); 343 (vitamin D in colostrum); 360 (vitamin A deficiency and reproduction); 383 (biochemistry—a text-book); 385 (pathology of nutritional disease—a text-book).

DISEASES, GENERAL

COLYER, F. (1947.) **Dental disease in animals.**—*Brit. dent. J.* 82. 2-10; 81-85. [Abst. in *Nutr. Abstr. Rev.* 17. 205. (1947), copied *verbatim*.] 316

It is shown, by a survey of some thousands of specimens from the wild and captive states, that although caries and parodontal disease occur to some extent in animals in the wild state, the incidence of these diseases is very much greater in captivity. In animals in the wild state caries occurs where attrition has created a "catchment area" between the teeth where food debris can accumulate. In animals in captivity the initial

manure reported by HAMMOND (1942 & 1944) was studied in comparison with all known growth factors and found to resemble none of them. Materials supplying *Lactobacillus casei* factors did not give the cow manure factor, which could not be replaced by any hitherto recognized factors from liver, yeast, fermentation residues or alfalfa leaf meal.

II. A concentrate of the active factor was obtained by extraction of cow manure with boiling water or 50 or 95% ethanol but not with ether or chloroform. The activity was stable to dry heat at 100°C. for one hour and to autoclaving for 15 min. The most active concentrates stimulated growth as 3.75-7.5 mg. per 100 g. diet in rations containing no animal protein. The factor was transmitted through the egg to the chick from hens having diets containing cow manure. The amount thus transmitted was sufficient to promote good growth for six weeks from hatching.

—A. M. COPPING.

SOGNNAES, R. F. (1947.) **A possible role of food purification in the etiology of dental caries.**—*Science.* 106. 447-448. 315

The difficulties are discussed of producing experimental dental caries by means of highly purified diets and it is suggested that the animals were too mature at the beginning of the tests.

An analysis of the trend of dental caries in about 800,000 children surveyed by various workers in Europe indicated a time lag in the effect of wartime diets on caries susceptibility. In general the wartime diets were less refined than those of pre-war years and it was possible that the diet of the mother affected the development of the teeth in the offspring and that the effect of purified or natural diets on teeth would be cumulative throughout several generations.

—A. M. COPPING.

carious lesion is in the enamel. The highest incidence of caries in wild animals is in the primates, 1.7 per cent. of the specimens examined showing caries; localised bone destruction due to food packing between the teeth is most frequently found in these. From comparison of the general run of soft and carbohydrate foods given to animals in captivity with the foods which they normally consume in the wild state, it is concluded that "caries and parodontal disease are due to an alteration in the environment of the teeth."

SALGUES, M. R. (1940.) **Lésions anatomiques et modification tissulaires et humores au cours**

de l'ostéomalacie des animaux domestiques. [The pathology of osteomalacia in domestic animals.]—*Rec. Méd. vét. exot.* 13. 22-38. 317

Six cases of osteomalacia, one in a dog and five in sheep, without any complicating vitamin deficiency were described. The bones and articulations of the skull were unchanged. The vertebral column was found intact except in its lumbar and caudal regions, where the apophyses of the vertebrae were affected. There were lesions in the ribs but the most severe changes were found in the pelvis and posterior extremities. Deformation of the surface of the femur and tibia with changes in the joints were very marked. Chondromalacia and acute arthritis with sero-mucous infiltration of the synovial membranes were observed. The main visceral lesions were found in the gonads. The testes contained atrophied tubules with hypertrophy of Sertoli cells. The ovaries were sclerotic and inflamed with microcysts and degeneration of follicles. The blood picture consisted of severe anaemia with monocytosis. Lipoid, mineral phosphorus, and blood glutathione levels were low. The skeletal muscles were low in weight because of a decrease in mineral salts and a relative increase of fats and proteins.—E. KODICEK.

JONES, T. C., ROBY, T. O., & MAURER, F. D. (1946.) The relation of riboflavin to equine periodic ophthalmia.—*Amer. J. vet. Res.* 7. 403-416. 318

An earlier paper [see *V.B.* 15. 396] had shown the similarity of the ocular lesions in equine periodic ophthalmia and riboflavin deficiency.

Attempts to treat established cases with riboflavin, nicotinic acid, brewer's yeast, vitamin A and dried skim milk were unsuccessful. When oral administration of riboflavin was accompanied by intravenous injection of ascorbic acid some benefit was noted.

The riboflavin content of feeding stuffs was found to be very variable and trials were made of giving to normal horses rations of very low riboflavin content. Some increase was obtained in the incidence of periodic ophthalmia but the most frequent symptom in the horses on this ration was a vascularizing keratitis.

Fluorimetric estimation of riboflavin in eyes, adrenals and liver from normal and affected horses gave lower values for tissues from affected horses and from horses having a low intake of riboflavin.

Administration of riboflavin in doses of 40 mg. daily mixed with bran to 180 horses which had previously had attacks of periodic ophthalmia, and later to about 350 horses, prevented further out-

breaks of the disease. The cost of the treatment was not prohibitive and the authors recommend its use for regions where periodic ophthalmia is prevalent.—A. M. COPPING.

JONES, T. L. (1947.) Rhinitis in swine. Control programme to cope with costly disease.—*Agric. Inst. Rev.* 2. 274-279. 319

The disease is considered to be unquestionably infectious although the aetiological agent has not been determined. Many outbreaks have been traced to introduction of breeding stock from affected to non-affected premises. Transfer of infection will take place in pigs a few days old by exposure to infected animals or instillation of morbid material, but not in month-old pigs. Convalescent serum and *Corynebacterium pyogenes* serum, and toxoid and killed suspensions of this organism gave no protection. It is concluded that all pigs with deformity of the snout or other signs of rhinitis are capable of transmitting infection to unweaned pigs. Pigs from litters where rhinitis is present are potential carriers even though they appear healthy. Pigs from infected premises serve as a source of infection to healthy herds. Brood sows that were mature before the outbreak will not carry the infection but must farrow in isolation to avoid contact between the unweaned pigs and infected ones.—R. GWATKIN.

GLENNEY, W. C. (1946.) Value of hemograms in the differential diagnosis of diseases of dairy cattle.—*N. Amer. Vet.* 27. 347-350. 320

The use of routine blood cell counts in dairy cattle practice is recommended. Blood changes are discussed in relation to diagnosis of pericarditis, pyelonephritis and other inflammatory conditions. Acetonaemia is considered under the classification "hepatitis."—T. H. FRENCH.

KLEMPERER, P. (1947.) Diseases of the collagen system.—*Bull. N.Y. Acad. Med.* 23. 581-588. 321

K. puts forward the hypothesis that the fibre-forming connective tissues distributed throughout the body represent an organic whole united by identity of basic texture and similarity of function. Some diseases, e.g. disseminated lupus erythematosus, generalized scleroderma, acute rheumatic fever, periarteritis nodosa, diseases with variously situated lesions and, therefore, diverse symptoms, can be more readily appreciated as pathological entities if we recognize the basic lesion as being of the collagen system. Despite the similar systemic involvement of collagen tissue, K. distinguishes these diseases one from another on anatomical and clinical grounds. He makes it clear, however, that his desire is solely to call attention to the basic alterations found on histo-

logical examination and not to assert that these diseases are thereby defined in an adequate manner. Although fibrinoid collagen alteration is a feature of local anaphylaxis, K. thinks that such changes must not be interpreted solely and invariably as an expression of allergic reaction. The chemistry of connective tissue and of fibrinoid degeneration of collagen still requires investigation.—L. M. MARKSON.

POVAR, M. L., & BROWNSTEIN, B. (1947.)
Valvular endocarditis in the fowl.—*Cornell Vet.*
37. 49-54. 322

A survey was undertaken during June and July 1945, in order to ascertain the incidence and possible significance of valvular endocarditis.

The lesions varied in extent from small glistening bead-like granules to caseating and oedematous areas up to 0.75 cm. in length. 129 lesions were found in 86 fowls out of 731 examined P.M. 26% of the lesions affected the right atrioventricular valve. The pulmonary semi-lunar valves had involvement in 32% of cases. 33% of the lesions occurred on the semi-lunar valves of the aorta. In only 9% of the cases was the left atrioventricular valve affected.

Culture from the lesions yielded staphylococci and streptococci. There was a significantly higher incidence of valvular endocarditis in birds with chronic conditions such as salpingitis or bumble

See also absts. 185 (laminitis); 292 (canine hysteria); 384 (veterinary surgical pathology—a text-book).

POISONS AND POISONING

MAAS, E. E. (1947.) **Arsenic content in urine from cattle dipped in arsenical solutions.**—*J. Amer. vet. med. Ass.* 110. 249-250. 324

Using four cows which were dipped every 14 days in solutions containing 0.18-22% arsenious oxide, an average of 0.2 mg. of arsenic per l. was found in the urine on the fourteenth day after dipping. In urine samples from these cows collected 80 hours after dipping the amount of arsenic was approximately uniform and averaged 3.95 mg. arsenic per l. No rain fell from the time the cattle were dipped to the time when the urine was collected in these tests. In two cows exposed to several showers of rain after dipping, the urine samples collected 80 hours after dipping contained smaller amounts of arsenic.

Cattle dipped just prior to transportation by boat and without access to water or food during the voyage gave an average of 43 mg. of arsenic per l. of urine after 25-30 hours.

In the transported animals there was slight desquamation in regions of the udder, vulva and anus.—H. PAVER.

foot than in birds dying from other causes.

In two cases in birds 13-16 weeks old, in good condition, death appeared to have resulted from circulatory embarrassment caused by the endocarditis. This condition is considered to be mainly secondary to other conditions elsewhere. By itself it is responsible for only a very small death rate.—D. LUKE.

FIELD, R. A., RICKARD, C. G., & HUTT, F. B. (1946.) **Hemophilia in a family of dogs.**—*Cornell Vet.* 36. 285-300. 323

A report of a condition affecting the males in a family of pedigree dogs (breed not stated), characterized by persistent and uncontrollable haemorrhage.

The blood possessed the following properties:—coagulation time (Lee White) increased (32-39 min. against the normal 3.1-6.3 min.); bleeding time, prothrombin time, platelet count and clot retraction time were within normal limits. Quick test for haemophilia (clotting time of recalcified plasma) was positive.

None of the bitches were affected but some of them were shown to be carriers.

From the above and other supporting data the authors conclude that the condition is one of haemophilia.

For a comparable disease in pigs, see *V. B.* 12. 600.—J. A. J. VENN.

MCCANN, P. J. (1946.) **Ngaio poisoning of cattle.**—*N.Z. J. Agric.* 72. 139-140. 325

The green or dry foliage of the Ngaio tree (*Myoporum laetum*), when eaten in quantity by cattle, pigs, sheep and possibly horses, causes severe illness and death in most affected animals. This is most likely to occur when other feed is scarce, such as during heavy snow falls when branches or trees become broken down. The symptoms of affected animals are constipation, colic, general depression, icterus and photosensitivity. Abomaso-enteritis was the most prominent P.M. finding. Demulcent and eliminative therapy is indicated. Prevention by herding stock in paddocks free from Ngaio until fallen branches can be removed or burnt is recommended. Sheep are not naturally affected, but experimental poisoning in sheep has been described by CUNNINGHAM & HOPKIRK [see *V. B.* 16. 278] who explained the occurrence of icterus and photosensitivity as being secondary to liver congestion. The toxic principle is an essential oil contained in the leaves.—J. B. SWAN.

RODRIGUEZ, J. A. (1945.) Diferenciación entre la enfermedad de los rastros y la meningo encefalomyelitis infecciosa de los equinos. [Differential diagnosis of a toxic encephalitis caused by *Aspergillus maydis* infected fodder and equine infectious encephalomyelitis.]—*An. Soc. rur. argent.* 69. 305-307. 326

"Maize stalk disease" attacks horses in the autumn and is due to contamination of the forage, principally maize stalks, with *Aspergillus maydis*. In a severe case there are irregular gait, inco-

ordination and paralysis, especially of the lower lip. The sight fails, the animal stumbles and falls. Death may occur at any time from six hours to four days after the onset of symptoms, but many cases recover. There is no fever at any time of the illness. It occurs sporadically, attacking one or two horses at a time. On P.M. examination there is degeneration of the cerebral cortex.

The differential diagnostic characters of equine encephalomyelitis are discussed.

—R. MACGREGOR.

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

SHARAF, A. EL A. (1947.) Medical (soluble veronal) hypnosis, anaesthesia and toxicity in dogs.—*Vet. J.* 103. 358-364. 327

The dose of medinal to produce hypnosis in dogs was found to be 0.0375-0.1 g. per kg. body weight. The body temperature gradually falls with increasing doses, and the respirations become slow, shallow and irregular with doses of about 0.2 g. per kg. body weight. The anaesthetic dose was 0.18-0.2 g. per kg. given subcutaneously. The pedal reflex was the last to be abolished and, in one case, was present after exceeding the anaesthetic range. The pupil was contracted during anaesthesia, but became dilated when the anaesthetic range was exceeded.

The M.L.D., considered as the dose which produced death in 50 % of dogs, was found to be 0.25 g. per kg. body weight. The symptoms before death were coma, depression of respiration, fall in body temperature, and mydriasis with widely dilated pupils. S. recommends the use of medinal in the doses given, but points out that the anaesthetic dose approximates the M.L.D., so that clinical application demands care.

—J. O. L. K.

WASTRACK, W. R., & LEWIS, G. (1947.) A clinical evaluation of sulfamerazine in infections of cattle.—*J. Amer. vet. med. Ass.* 110. 108-113. 328

An account of the results of the use of sulphamerazine (4-methyl-2-sulphanilamido-pyrimidine) in the treatment of clinical cases of infectious diseases in cattle. For pneumonia in calves the dosage was 0.15 g. per kg. body weight; about half this dosage was used for pneumonia, or haemorrhagic septicaemia complicated by pneumonia, retained placenta, endometritis and septicaemia associated with acute mastitis in adult cattle. The main conclusion drawn from the evidence given for individual cases was that small doses of sulphamerazine are as effective in pneumonia in calves as larger doses of other

sulphonamides, the response being more rapid and the period of treatment shorter than for other members of the sulphonamide series.

The suggestion is made that the dosage required to treat pneumonia in cattle, on a body weight basis, is smaller for heavy animals in good condition than for undersized animals in a poor state of nutrition.—A. E. EDEN.

KANEGIS, L. A., & ROEPKE, M. H. (1946.) DDT: a review with special reference to veterinary medicine.—*J. Amer. vet. med. Ass.* 108. 316-321. 329

This is a review from the veterinary point of view of the literature concerning the pharmacological, toxicological and insecticidal uses of D.D.T. Absorption of powdered D.D.T. through the skin is practically negligible, but toxic manifestations may follow the application of an oily solution. When given *per os* in the form of a powder only a limited proportion is absorbed but this is variable and cumulative.

D.D.T. has been found effective against *Stomoxys*, *Simulium*, *Siphona* (*Lyperosia*), the sheep ked, fleas, ticks, lice and bed-bugs, but not against tabanids or mites. It should be used cautiously on food-producing animals and dairy cows because of tissue accumulation and possible concentration in cream and butter. A bibliography is given.—BERYL A. THURSTON.

RAMON, G., & RICHOU, R. (1947.) De l'antagonisme microbien. Conclusions à une étude expérimentale. (7e mémoire.) Considérations générales sur les "complexes antagonistes" déductions thérapeutiques. [Experimental study of bacterial antagonism. General considerations and therapeutic possibilities.]—*Rev. Immunol. Thérap. antimicrob.* 11. 197-205. 330

The authors investigated culture filtrates of *B. subtilis*, *Penicillium notatum* and *Actinomyces griseus* and studied their action on pathogenic bacteria. They found that these filtrates not only contain antibiotic substances, but also possess the property

of annihilating the exotoxins of staphylococci, diphtheria bacilli, tetanus bacilli and the toxins of the gas gangrene organisms. In addition they contain proteolytic enzymes. Therefore these filtrates are designated "complexe antagoniste" by the authors. They advocate the use of these filtrates—prepared according to their special methods—by the clinician in order to test their therapeutic value.—E. KLIENEBERGER-NOBEL.

FABRICANT, C. G. (1948.) **Studies on blood levels of penicillin in domestic fowls and the effect of penicillin on poultry pathogens in vitro.** pp. 111. Thesis, Cornell. 331

Blood concentrations of penicillin obtained in normal fowls after various methods of administration reached and maintained levels considered to be bacteriostatic in man and other animals. The levels in fowls would have been higher (than recorded in this thesis) if they had been corrected to the inhibition level for *B. subtilis* produced by the FDA standard crystalline sodium penicillin G.

The following methods of penicillin administration in White Leghorn fowls are listed in descending order of efficiency:—(a) two simultaneous injections, one intravenously and the other subcutaneously or intramuscularly; (b) single subcutaneous injection and (c) single intramuscular injection.

The methods of penicillin administration in White Holland turkeys arranged in descending order of efficiency are:—(a) single intramuscular injection; (b) single subcutaneous injection; (c) intravenous injection, and (d) administration *per os*.

An oil and wax preparation of penicillin was found to be too difficult to use under field conditions.

The *in vitro* sensitivity of *Erysipelothrix rhusiopathiae* would make treatment worth while. The sensitivities of *Pasteurella avicida* and *Erysipelothrix (Listeria) monocytogenes* (some strains) indicated that infections caused by these organisms might be treated successfully with penicillin.

Penicillin was ineffective against *Salmonella* or *Shigella gallinarum*.

Bacterium coli and *Proteus vulgaris* were less sensitive than *Erysipelothrix*, *Pasteurella*, *Listeria*, *Salmonella* and *Shigella* species to penicillin *in vitro*. Therefore, it would not be possible to isolate these organisms by incorporating this antibiotic in the medium to inhibit selectively the other organisms used in these studies.—H. L. G.

LEWIS, G. M., HOPPER, M. E., & SCHULTZ, S.

(1946.) **In vitro fungistasis by a bacterium (*Bacillus subtilis* var. XG and XY).**—*Arch. Dermat., Berl.* 54. 800-807. [Abst. in *Bull. Hyg., Lond.* 22. 285. (1947), copied *verbatimim*.] 332

CHAMBERS & WEIDMAN (1928) cultivated *B. subtilis* from the skin between the toes of patients, found that it inhibited the growth of pathogenic fungi *in vitro*, and treated dermatophytosis by applying living cultures of it.

The present authors were testing 3 strains of *B. subtilis*, apparently with a view to repeating these observations. None of their strains had any effect on the growth of *Trichophyton gypseum*, but the colony of an accidental contaminant in one plate produced a zone of inhibition. This colony consisted of sporogenous Gram-positive bacilli: two colonial forms were obtained in subculture, and it is not clear whether they were variants or different species; if the latter, one was *B. subtilis* and the other *B. mycoides*.

The rest of the paper describes the preparation of culture filtrates from these two organisms, and tests of their capacity to inhibit the growth of various fungi and bacteria. Many species of fungus were susceptible to one of the filtrates. It was also found that these filtrates were actively haemolytic. Growth-inhibitory and haemolytic actions were both abolished by boiling, but reasons are given for believing that they are due to different substances.

NETER, E., HUBBARD, R. S., & LAMBERTI, T. G. (1945.) **The relative efficacy of penicillin, tyrothricin, streptothricin and sulfathiazole on haemolytic streptococcus in wounds of rabbits.**—*Amer. J. Surg.* 69. 204-207. [Abst. in *Bull. Hyg., Lond.* 21. 135. (1946), copied *verbatimim*. Signed: L. P. GARROD.] 333

Artificial wounds in rabbits were inoculated with broth culture of a haemolytic streptococcus, and treated with antiseptics, to all of which this streptococcus was susceptible *in vitro*. Results were judged by the amount of growth of this organism obtained from swabs from the wound taken the next day. Sulphathiazole had almost no effect, but tyrothricin, streptothricin and penicillin all reduced greatly the number of streptococci in the wound. Comparison between these three is difficult, because several different quantities of each were used, but it seems noteworthy that 13 out of the 16 wounds in which no streptococci at all could be found, had been treated with penicillin.

See also absts. 183 (penicillin and staphylococci in nose and skin); 184 (sulphanilamide for strangles); 197 (alcohol as disinfectant); 199 (penicillin in pyelonephritis); 215 (sulphamerazine in pullorum disease); 235 (antimony and *Donovania granulomatis*); 236 (contagious bovine pleuro-pneumonia); 244 (dourine); 245 (leishmaniasis); 250 and 251 (malaria); 254 (theileriasis); 256 (foot and mouth disease); 255 (DDT); 286 (benzene hexachloride); 289 (fascioliasis); 302 (sarcoma).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

BEZSSONOFF, N., & LEROUX, H. (1946.) Sur la teneur en cuivre du cristallin de l'homme et du boeuf. [The copper content of the lens in man and cattle.]—*C.R. Soc. Biol. Paris.* **140.** 605–607. **334**

Vitamin C is present in the lens of the eye but its biochemical activity is largely conditioned by the copper content of the lens. Methods of detection so far described depend on the incineration of the lens which causes loss in the copper content of the tissues. The authors describe an attempt to estimate the copper by crystallizing out in solution, and by colorimetric methods using various reagents. The results obtained indicate that the normal human lens contains 4 μ g. of copper compared with 2 μ g. per g. in cattle. The authors consider that this is sufficient to ensure catalytic action in vitamin C oxidation. They also suggest that previous results with sliced lens affected with cataract which constantly gave a positive copper content in contradistinction to sliced normal human lens, can best be explained by supposing that in normal lens the copper is localized in certain positions whereas in lens affected with cataract it is diffused throughout the organ.—A. H. HOGG.

McMASTER, P. D. (1947.) The relative pressures within cutaneous lymphatic capillaries and the tissues.—*J. exp. Med.* **86.** 293–308, [Author's summary copied *verbatim*.] **335**

The pressure in the cutaneous lymphatic capillaries of normal mice anesthetized with nembutal ranged between 0.0 and 2.7 cm. of water. Measurements of the interstitial pressure in the tissue immediately next the lymphatics showed that, in more than half the instances studied, there was a slight gradient of pressure from the tissues to the lymph. In nearly all the other instances the pressures inside and outside the lymphatic capillaries were approximately equal. In two cases in which lymph flow in the capillaries was rapid, the lymph pressure may have been negative. Under these circumstances there must have been a considerable gradient of pressure from the tissues to the lymph.

In skin which was rapidly becoming, or had recently become, edematous as result of the application of xylol or of heat, the intralymphatic capillary pressure generally was increased, yet when compared with the pressure prevailing in the edema fluid outside of the capillaries it was usually found to be relatively much lower, at times by as much as 5.9 cm. of water. The findings indicate that a pressure gradient is an important factor in lymph formation under normal and pathological circumstances.

Cragg, J. B., & DAVIES, L. (1947.) Sweating in sheep. [Correspondence.]—*Nature, Lond.* **159.** 34–35. **336**

By means of cobalt chloride papers, humidity near the skin surface was found to be greater than near the outer surface of the fleece, and the authors consider this result to be due to sweat secretion by the skin. Humidity throughout the fleece was markedly raised after ten min. forced exercise of the sheep during hot weather. Only one sheep was used, and control sheep are not mentioned.—G. B. S. HEATH.

KELLER, A. D., LAWRENCE, W. E., & BLAIR, C. B. (1945.) Effects of varying degrees of hypophysectomy in the dog.—*Arch. Path.* **40.** 289–308. **337**

Observations on hypophysial deficiency symptoms were made on over 300 dogs subjected to one of the following five types of hypophysectomy:—(1) "near ordinary" hypophysectomy in which the posterior lobe, a fragment of the pars tuberalis and about 90% of the pars anterior were removed; (2) "ordinary" hypophysectomy in which all the pars anterior was removed with the minimum of stalk; (3) "ordinary-plus" hypophysectomy in which the distal portion of the pars tuberalis and infundibulum were also removed; (4) "near-total" hypophysectomy in which all the hypophysial tissue except the very proximal portion of the pars tuberalis and infundibulum was removed; and (5) "total" hypophysectomy in which all hypophysial tissue was removed without detectable gross infringement on the hypothalamus.

After hypophysectomy the status of the animal's carbohydrate reserves was determined by observations on the post-absorptive blood sugar level, the blood sugar level after periods of fasting, and by insulin tolerance tests. Three to four months after hypophysectomy the dogs were pancreatectomized and further studies made on the blood sugar level. If the Houssay effect developed glucose tolerance tests were made. Adrenal function was investigated by noting the animal's resistance to reduction in the sodium content of the diet. Changes in the sex cycle and in the appearance of the external genitalia were recorded and observations made on the growth rate of the animal, the degree of obesity, and the texture of the hair. A careful P.M. examination was made on each animal and serial sections made of the hypophysial region of the brain.

A consideration of the results indicated that only three of the usual deficiency symptoms associated with hypophysectomy could be reliably associated with removal of the anterior lobe *per*

se; these were regression of the sex functions, cessation of growth and change in the texture of the hair; the latter, however, appeared to be related to the cessation of growth rather than to an independent factor. The lowering of the carbohydrate reserves, the occurrence and magnitude of the Houssay effect, and the decrease in adrenal function were associated with the progressive encroachment on the hypophyseal stalk tissue, after the removal of the pars anterior and the posterior lobe. While the removal of the pars anterior resulted in a four- to tenfold reduction in the animal's ability to tolerate carbohydrate, "total" hypophysectomy produced a sixty- to hundredfold reduction in tolerance. Obesity developed after most cases of "near ordinary" and "ordinary" hypophysectomy and was generally more obvious in young animals. It invariably followed "total" and "near total" hypophysectomy. Obesity also developed following injury to the hypothalamus, the adenohypophysis being undisturbed, but it was not as a rule precipitated by section of the hypophyseal stalk or removal of stalk tissue. Failure to encounter certain of the classic deficiency symptoms after hypophysectomy in certain animals when no functional glandular remnants had been left was considered to be due to injury to the hypothalamus. The authors postulate that the hypothalamic tissues secrete hormones having actions opposite to those of the known hypophyseal hormones and whose effects they counterbalance in the intact animal. Removal of one or other of these systems leaves the "target" mechanisms under the unrestricted control of the remaining system, resulting in hyper- or hypofunction as the case may be, while removal of both systems does not greatly alter the *status quo* of the "target" mechanism.

In studies on the effects of hypophysectomy in dogs, the necessity of force-feeding those dogs which develop anorexia in the immediate post-operative period is stressed.—ALFRED T. COWIE.

SETINSKI, Z. (1944.) Rentgenska slika skeleta giave mačke. [X-ray picture of the cranium of the cat.].—*Vet. Arhiv.* 14. 147-164. [German summary.] 338

The X-ray pictures are shown in lateral, dorso-ventral, ventro-dorsal projection. The head is so small that all parts of the skull can be shown on one plate. In certain parts individual bones are not well differentiated because they differ little in size and calcium content. The soft parts, having low density, show only as thin transparent shadows which do not conceal appreciably the outlines of the bones. The X-ray picture of the bone preparation and of the whole cranium is described, with no essential differ-

ence between them except that in the latter the shadows are rather less definitely outlined. The better mode of projection for showing up the individual parts of the skull is indicated. It is interesting to note that most detail appears to have been obtained by exposures of 80 to 100 milliamperes seconds (milliamperes \times seconds) using 55 kv.—K. J. SINCLAIR.

KIST, S. (1942.) O razvijenosti i raspodjeli žlijezda u koži zamorčeta (*Cavia porcellus*). [Size and distribution of skin glands in the guinea pig.].—*Vet. Arhiv.* 12. 387-396. [German summary.] 339

The occurrence of skin glands was investigated in two male and two female g. pigs.

Sebaceous glands were found associated with hair follicles in all areas of the body, particular areas of concentration being about the natural orifices and in the skin over the carpal and tarsal joints. A distinct group was found on the oral surface of the outer ear. In general, these glands were better developed in the male and this was particularly noticeable in the perineal region where they can be clearly differentiated from the anal glands. True supracaudal glands were present only in the male. Tubular-type glands were found only between the pads of the feet, in the female on all four feet, in the male only on the fore feet.

K. confirms that the harderian gland of the eye is a modified skin gland.—C. W. OTTAWAY.

ZLOTNIK, I. (1947.) Types of cells present in cow's milk.—*J. comp. Path.* 57. 196-208. 340

Quarter fore-milk samples from seven non-pregnant, poor-milking heifers were examined for cells during a whole lactation period. In normal milk a large proportion of cellular elements consists of epithelial cells. Six main types of these were found, epithelial cells with clear cytoplasm, epithelial cells with neutrophilic foamy cytoplasm, epithelial cells with acidophilic foamy cytoplasm, epithelial cells with basophilic foamy cytoplasm, degenerated cells with polymorphic nuclei and micro-pseudocells. Other cells found were:—neutrophile polymorphonuclear leucocytes similar to those found in blood, coarsely granular eosinophiles of great variety, large and small lymphocytes, monocytes, large squamous cells, red blood corpuscles and the debris of epithelial cells and free nuclei.

The large and small lymphocytes were common during the first four weeks of lactation and the proportion of epithelial cells to epithelial pseudo-polymorphs and micro-pseudocells varied from day to day.

True polymorphonuclear leucocytes of both

the neutrophile and eosinophile varieties were almost invariably absent from normal milk.

These same cells with certain new types were also found in milk from cows with mastitis. The polymorphonuclear neutrophile leucocytes were the most common abnormal cells found in milk from cows infected with *Streptococcus agalactiae*, and in certain cases they formed 28% of the total cell count. A significant observation was that neutrophiles appeared in varying numbers, even up to 22% of the total cell count, when other signs of mastitis were absent and the total cell count itself was as low as 2,500. Monocytes may also be found in varying number, but since they were not found in normal milk, their presence indicates an abnormal state of the udder. The appearance of typical neutrophiles and eosinophiles in milk from apparently healthy cows should, therefore, be looked upon as an early indication of mastitis.

—A. L. WILSON.

*KUCH, W. (1943.) Der Haemoglobin-Gehalt bei gesunden und kranken Rindern (ermittelt mit dem Haemoglobinometer "Gim"): [The haemoglobin index in healthy and diseased cattle.]—*Inaug. Diss., Hanover*. [Abst. from abst. in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* 51/49. 236.] 341

The haemoglobin values were measured by means of the "Gim" haemoglobinometer. A standard blood solution (that of a normal healthy human being) was taken as representing 100° Hb. content, i.e., 17.3 g. oxyhaemoglobin in 100 ml. blood.

The haemoglobin content of the blood of 84 healthy cattle averaged 60° (9.60 g.%) compared with an average value of 55° (8.80 g.%) in the blood of 75 cattle which were ill [no details given].—J. ZWEIG.

DIETZ, A. A. (1946.) Composition of normal bone marrow in rabbits.—*J. biol. Chem.* 165. 505-511. [Author's summary slightly amended.] 342

There is a direct linear relationship between the water and residue (lipoid-free solids) and an inverse linear correlation between these two components and the lipid content of the marrow.

The total nitrogen concentration of the marrow varies directly with the residue and water and inversely with the lipid.

The log of the lipid nitrogen (extracted with alcohol-ether) is inversely proportional to the lipid concentration.

With advancing age there is a decrease in the water, residue, total nitrogen, and lipid nitrogen and an increase in the lipid concentration of normal bone marrow.

EATON, H. D., SPIELMAN, A. A., LOOSLI, J. K.,

THOMAS, J. W., NORTON, C. L., & TURK, K. L. (1947.) The placental transfer and colostrum storage of vitamin D in the bovine.—*J. Dairy Sci.* 30. 787-794. 343

Holstein cows which were kept on a diet of timothy hay, maize silage and mixed grain were given daily 100,000 I.U. of vitamin D as irradiated yeast for eight weeks before calving. The blood plasma after six weeks of supplementation contained 282 I.U. per 100 ml. as compared with 167 I.U. in cows on the same diet but receiving no supplement. No consistent difference was noted in the vitamin D content of the plasma or liver of new-born calves from the control and experimental groups. The vitamin D content of the colostrum was markedly affected by the cow's intake of the vitamin, the average values obtained from April to May and from September to October in the experimental group being respectively 60 and 180 I.U. per lb. of colostrum, while the corresponding figures from the control group were 18 and 35 I.U. The level of vitamin D in maternal plasma, and in the plasma and liver of the new-born calf during the autumn period was appreciably higher than in the spring.—E. M. C.

CHU, J. P., LEE, C. C., & YOU, S. S. (1946.)

Functional relation between the uterus and the corpus luteum.—*J. Endocrinol.* 4. 392-398. 344

Hysterectomy at 11-14 days after coitus prolonged the survival of the corpora lutea in pseudo-pregnant rabbits, the corpora lutea lasting for 27 days instead of the average 15 days. If the hysterectomized pseudo-pregnant rabbits received auto-transplants of uterus the survival time of the corpora lutea was reduced to normal. Daily injections of 1 mg. oestrone maintained the corpora lutea in normal pseudo-pregnant rabbits for as long as the injections were given. When pregnant rabbits were hysterectomized 7-14 days after coitus the life of the corpora lutea was reduced to 20.5 days instead of the normal 28 days in pregnancy. Placental autotransplants or daily injections of oestrone prolonged the life of corpora lutea in hysterectomized pregnant rabbits to the normal span. Removal of the placentae of foetuses at the 11-15th day of gestation also caused the regression of the corpora lutea. It is thought that oestrogen may be the common factor necessary for the maintenance of the corpora lutea both in pseudo-pregnancy and pregnancy. It is postulated that removal of the uterus in the pseudo-pregnant rabbit may have a "sparing" action on the circulating oestrogen and thus leave more at the disposal of the corpora lutea, thereby prolonging their survival. In pregnancy it is thought that the uterus plays a minor role in these phenomena and that the production of oestrogen or some

other luteal regulating substance by the placenta is the main factor.—ALFRED T. COWIE.

LARDY, H. A., WINCHESTER, B., & PHILLIPS, P. H. (1945.) **The respiratory metabolism of ram spermatozoa.**—*Arch. Biochem.* 6. 33-40. 345

Ram spermatozoa washed free from seminal fluid maintained their respiration and motility when stored for several hours in calcium-free Ringer-phosphate, at pH 7.25 and at room temperature, this condition depending on their relatively high content of phospholipoid. Substances which increased respiration (pyruvate, succinate, egg phospholipoid) also prolonged motility. Considerable variation in respiration rate was found between samples of spermatozoa from different rams and also between different ejaculates of the same ram.—T. H. FRENCH.

KRÖLLING, O. (1947.) **Zur Anatomie des Mittelfuss-Skelettes bei den Equiden. [Anatomy of the equine metacarpus.]**—*Wien. tierärztl.*

See also absts. 308 and 309 (rumination).

PUBLIC HEALTH, VETERINARY SERVICES AND VETERINARY EDUCATION

HOFSTRA, K. (1941.) **Het bacteriologisch "vleesch"-onderzoek. [Bacteriological inspection of meat.]**—*Tijdschr. Diergeneesk.* 68. 960-966. [English, French and German summaries. Abst. from English summary.] 347

In the course of ten years at the abattoir at the Hague it was found that in the instances in which bacteriological procedure was followed for the inspection of suspected meat, it was important to examine by this means muscular tissue in addition to spleen and kidneys and that in swine it was particularly necessary to examine lymph nodes. Cultures of *Streptococcus pyogenes*, *Bact. coli* and *Erysipelothrix rhusiopathiae* were organisms that were not uncommonly grown.—P. F. S.

DABRIGEON, J. (1946.) **Épreuve d'auto-fermentation de la viande en pratique d'inspection. Association avec la contrôle bactériologique de la moelle osseuse. [Tests for putrefaction in meat.]**—*Rec. Méd. vét.* 122. 72-76. 348

It is recommended that musculature should be tested for the presence of putrefactive organisms if the slaughtered animal was suspect. The test recommended is made with about 800 g. of the serratus cervicis and intercostals taken from parts adjacent to the rhomboideus, clean of all fat and connective tissue. This is incubated at 37°-38°C. for 24 hrs. and is considered free if there is no detectable odour of putrescence, exudation, green coloration, gas or moisture, and the reaction is slightly acid. Positive results in tests for putrefaction are most frequently found

M Schr. 34. 655-665.

346

K. presents fossil and histological evidence in reviewing the origin and form of the metacarpal bones of the horse. Sections of the distal extremity of the small metacarpal bones (mc. 2 and 4) in foals, from the newly born to ten months of age, are demonstrated to show diaphyseal bone growth capped by a small cartilage zone, a "joint cavity", epiphyseal growth and a pointed cartilaginous basal cap. These features gradually lose their separate identity and the distal extremities of the bones assume the characteristic apical form of the "button". The amount of growth is by no means regular and previous work by Rudert (1901) has shown that in 400 horses this rudiment of the small metacarpal bones was of equal size in 15% of cases, in 53% the medial, and in 32% the lateral being the larger. Considerable attention is focussed on the type of ossification in the epiphyseal centres which are shown to be chondro-epiphyses.—C. W. OTTAWAY.

when slaughter has followed long decubitus, dystocia, digestive trouble, gangrene, necrosis or large collections of pus. The test agreed with bacterial culture from bone marrow 33 times out of 41 (10 positive, 23 negative). In six cases the test showed putrefaction although culture was negative, while in two this was reversed. This "auto-fermentation test" is simpler than direct culture and just as accurate.—R. MACGREGOR.

PATRIZI, F. (1947.) **Caratteri distintivi delle carni c.d. febbrile o fermentate e delle carni in preda a degenerazione granulosa. [Characters of fevered meat.]**—*Zooprofilassi.* 2. No. 7. 1-8. 349

A conventional article.—R. MACGREGOR.

KURTZE. (1944.) **Erfahrungen mit dem Herztod der Schweine in der Ergänzungsfleischschau. [Fatal syncope in pigs in relation to meat inspection.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* March 3rd. 74-75. 350

K. collected data from the histories and P.M. examinations of 134 pigs with cardiac syncope slaughtered during a period of 13 months. There were no cases on the very large farms.

Detailed histories of the disease on nine farms are described and K. concluded that the condition is hereditary. The disease is usually restricted to certain districts and in K.'s district most of the breeding sows and boars came from two farms.

—A. L. WILSON.

BRANDLY, P. J. (1948.) **Poultry inspection as part of the public health program.**—*J. Amer.*

vet. med. Ass. 112. 10-17. 351

Many pathogens of poultry are also human pathogens, but they tend to be overlooked as they are frequently killed in cooking. Before cooking, however, such infected birds may have infected kitchen utensils and may thus cause disease under circumstances that cannot be traced back to the bird actually infected. Amongst diseases caused by fungi, aspergillosis occurs in man (as "pigeon feeder's" disease) and may be recognized in poultry carcasses by the yellow semi-liquid or caseated masses in the air sacs. *Achorion schoenleini* and *A. gallinarum* produce honeycomb or crusted ringworm in man and lesions on the wattles, comb and round the eyes of birds. *Monilia albicans* which produces thrush in children is found also in the crop of birds where it produces a thickening of the mucosa with white circular ulcers. Ornithosis or psittacosis is not, as formerly supposed, confined to parrots but has been found in pigeons and other birds; it produces a wasting of the pectoral muscles and serous and mucous effusions, but many birds are carriers with no visible symptoms. *Erysipelothrix* (*Listeria monocytogenes*, *E. rhusiopathiae*, *Brucella tularensis*, *Pasteurella pseudotuberculosis*, *Salm. pullorum*, *Shigella gallinarum* and Newcastle disease have also been found both in man and birds.

—R. MACGREGOR.

BAHR, L. (1947). The ratin bacillus and the "Ratin system" through 40 years.—*Maanedsskr. Dyrlaeg.* 59. 161-192. [In English.] 352

In the system referred to, a virulent culture of *Salmonella enteritidis* var. *danyisz* is put out for the rats to feed on and three weeks later a squill preparation is given, the products being marketed under the proprietary name in the title. Examples of successful application of this method are given. The virulence of the culture employed is stated to have remained unaltered for 40 years. It is also stated that no large-scale outbreaks of *S. enteritidis* infection have occurred in human beings or domestic animals in places where this method has been used.

[The article is written in terms strongly advocating this system of rat destruction which

See also abst. 206 (salmonella in milk).

LIVESTOCK HYGIENE

BENTZEN, O., MØRCH, E., & SKADHAUGE, K. (1947). Investigation into infection by air and dust in bacteriological laboratories.—*Acta path. microbiol. scand.* 24. 401-411. [In English.] 355

The authors examined the air in the streptococcus- and pneumococcus- departments of the State Serum Institute in Copenhagen with Bourdillon's slit sampler. In the streptococcus

See also abst. 220 (disinfection of incubators).

is not universally accepted.]—A. MAYR-HARTING.

STENIUS. (1945.) Omorganisation av lantbruksministeriets veterinäravdelning. [Finland: reorganization of the Veterinary Division of the Ministry of Agriculture.]—*Skand. VetTidskr.* 35. 666-668. 353

In October 1945 the Veterinary Division of the Ministry of Agriculture was completely re-organized and given more extensive duties and at the same time the status of the principal officers was greatly raised.

The extended duties of the Division were to include administration of the Veterinary College and of the Civil Veterinary Service; control of veterinary surgeons including their education, graduation and activities; supervision of the health service for livestock; organization of means of controlling livestock diseases; supervision of foodstuffs of animal origin; and animal protection.

This appears to be a very complete organization for looking after veterinary affairs in the widest sense, including meat inspection.—J. E.

MERCK, G. W. (1947.) Peacetime benefits from biological warfare research studies.—*J. Amer. vet. med. Ass.* 110. 213-216. 354

Methods and facilities have been developed for the mass production of pathogenic micro-organisms and their products. This is accompanied by development of methods for the rapid and accurate detection of minute quantities of disease-producing agents. Significant contributions have been made to the knowledge of the properties and behaviour of air-borne disease-producing agents.

A pure crystalline bacterial toxin of *Clostridium botulinum* Type A has been isolated and studied.

There has also been development of vaccines to protect fowls against Newcastle disease and fowl plague, and development of a vaccine for protection of cattle against rinderpest.

Information was obtained regarding the effect of more than a thousand different chemical agents on food and forage plants.—P. S. GORDON.

department many more streptococci were found than in the pneumococcus department. Pneumococci were found in the pneumococcus department only. The authors conclude that the air in the two bacteriological laboratories was infected with organisms from the samples handled in these places.—E. KLIENEGER-NOBEL.

REPRODUCTION AND REPRODUCTIVE DISORDERS

REMPT, D., & ZWANENBURG, T. S. (1948.) *Pseudomonas aeruginosa* (*Ps. pyocyanea*, *Bac. pyocyaneus*) in het sperma van drie dekstieren. [*Pseudomonas aeruginosa* (*Ps. pyocyanea*, *Bac. pyocyaneus*) in the semen of three stud bulls.] —*Tijdschr. Diergeneesk.* 73. 224-230. 356

Many cows served by a bull belonging to a breeders' association had returned to service.

During the 1946 season 119 cows had been served of which 65% became pregnant to the first service, and during the 1947 season 122, of which 57% became pregnant to the first service. Of the cows which returned to service some did so at regular and others at irregular intervals.

The bull was keen at service and on clinical examination the only abnormality noted was the presence of a few nodular areas on the dorsal surface of the penis. Examination for *Trichomonas foetus* gave a negative result.

Semen samples were of good quality as regards quantity, colour, consistency, motility and morphology of the spermatozoa. On bacteriological examination bluish-green colonies of Gram-negative bacilli grew on tryptose-agar media. The organism was identified as *Pseudomonas pyocyanea*.

The same organism was isolated from urine samples. Blood serum from the bull and eight cows was negative on agglutination tests with *Brucella abortus*, *Salmonella typhi-murium*, *S. dublin*, and with *Ps. pyocyanea* antigens. Two cows which had not been served by this bull were examined clinically, one had an acute vaginitis, the other nothing abnormal. All eight cows which had been served by this bull had some degree of inflammation of the vagina or cervix. Bacteriological examination of cervical mucus from these eight cows was negative for *Ps. pyocyanea*.

The bull was slaughtered after a period of two months during which no cows had been served. No macroscopic lesions were present on P.M. examination and on bacteriological examination of testicles, epididymis, prostate, bladder contents and urethra no organisms were cultivated.

A second bull was examined for use in an artificial insemination centre; it had served a number of cows which had previously been served by the first bull. *Ps. pyocyanea* was present in the semen.

A third bull aged two and a half years was also found to have *Ps. pyocyanea* in the semen. During the previous season 53 cows had been inseminated with its semen of which 51% became pregnant to the first insemination.

In all three cases the semen samples which were examined had been collected in the usual way using an artificial vagina and the method of sterilization of the artificial vagina and other apparatus is described.

The characters and pathogenicity of *Ps. pyocyanea* are discussed.

The authors state that *Ps. pyocyanea* does not occur as a contaminant in semen of healthy bulls which has been collected with the usual precautions and they consider that its presence in properly collected samples should lead to the rejection of bulls for A.I. work.—P. LE ROUX.

RAPS, G., & CANNON, C. Y. (1947.) The influence of management, breed, and season upon the pH of bull semen.—*J. Dairy Sci.* 30. 933-938. 357

The hydrogen-ion concentration of 371 ejaculates from 66 bulls housed at five different studs was determined over a period of eleven months. There was a marked difference between the care and management of the bulls in the different studs. The semen samples were collected at semi-monthly intervals during the early part of the investigation and at alternate months for the latter part.

The results were examined by an analysis of variance and showed a positive relationship between the pH of the semen and the individual studs. In the stud with the highest mean pH (7.13) the bulls were very badly managed, being kept in an ill-ventilated barn without exercise; their feet were uncared for and they were fed on hay with a low protein content without any regular addition of concentrates. This stud was subsequently disbanded because of its inability to maintain a normal conception rate. The stud with the lowest mean semen pH (6.57) had good management. The barn was clean and dry, the bulls were exercised and groomed daily, their feet were kept properly trimmed and feeding was on a high plane including vitamin A and D supplements.

A positive correlation was found to exist within the four breeds investigated but semen from Holstein and Brown Swiss bulls had a relatively lower pH than the Guernsey or Milch Shorthorn bulls. The semen of individual bulls, irrespective of breed, tended to maintain a fairly constant pH.

The monthly fluctuations in the average pH of the semen samples examined were wide, with February showing the highest values and May the lowest.

The authors do not give any information on

the methods used to determine the semen hydrogen-ion concentration or on the technique adopted for collecting the semen ejaculate.

—F. R. BELL.

BEZDEK, F. H. (1946.) **Unsuccessful attempts at collecting semen from captive foxes.**—*Amer. Fur. Breed.* **19.** 54 & 56. 358

Unsuccessful attempts were made to obtain semen from two foxes by massage after administration of varying doses of nembutal and morphine sulphate. Subsequent histological examination of sections of the testicles showed that at the time of the experiments neither of the foxes had reached the peak of reproductive activity.—M. C.

BASSETT, C. F., & LLEWELLYN, L. M. (1946.) **Timing fox matings for maximum production.**—*N. Amer. Vet.* **27.** 361-364. 359

In an experiment involving the mating of more than 200 vixens during three breeding seasons, the ratio of fertile to total matings and the average litter size were studied in relation to the time between the beginning of oestrus and coitus. Oestrus was timed from the first acceptance of the male in a trial interrupted-mating, and the six experimental groups comprised vixens mated early and late on this and the two subsequent days. Late mating on the day following first acceptance gave the highest conception rate, while litter size was unaffected by the treatments. The application of these findings to farm conditions is discussed.—T. H. FRENCH.

HODGSON, R. E., HALL, S. R., SWEETMAN, W. J., WISEMAN, H. G., & CONVERSE, H. T. (1946.) **The effect of vitamin A deficiency on reproduction in dairy bulls.**—*J. Dairy Sci.* **29.** 669-687. 360

Twelve bulls, which were reared on skim milk to six months of age, were given rations deficient with respect to vitamin A but otherwise adequate for normal growth. Deficiency symptoms were produced at different ages up to four years, by adjusting the vitamin A intake with varied amounts of cod-liver oil. When the deficiency became acute before the breeding age, the bulls failed to breed. If they reached the breeding age before the deficiency symptoms developed, the bulls were capable of breeding, though they were frequently unable to mount or ejaculate because of weakness. The semen was fertile, but had a high percentage of abnormal spermatozoa. On P.M. examination cysts were found in the pituitary glands, particularly in animals in which the deficiency developed at an early age, and there was extensive degeneration of the seminiferous tubules. It was concluded that gross symptoms of vitamin A deficiency were likely

to be observed before the reproductive capacity of a bull was seriously effected.—E. M. C.

BENESCH, F. (1947.) **Zur Diagnose und Behandlung des Uteruskatarrhes steriler Stuten. [Diagnosis and treatment of uterine catarrh in sterile mares.]**—*Wien. tierärztl. Mschr.* **34.** 507-518. 361

B. uses uterine irrigations sparingly, but in some cases uses retention injections as a treatment of choice, using a proprietary preparation of isotonic iodine, 0.035-0.04% in aqueous solution. A quantity of about 750 ml. is injected through a catheter, outflow is prevented by application of cervix forceps and the mare made to trot for a few min. before the forceps are removed. All the iodine is said to be absorbed gradually from the whole of the endometrium. The technique is illustrated by photographs of the genital tract during the various stages of treatment.—J. E.

WEBER, A. F., MORGAN, B. B., & McNUTT, S. H. (1948.) **A histological study of metrorrhagia in the virgin heifer.**—*Amer. J. Anat.* **83.** 309-320. [Authors' summary and conclusions copied verbatim.] 362

The histology of metrorrhagia was studied in 22 clinically normal virgin heifers. It was observed that endometrial edema began during early proestrus and reached a maximum during the 1st day postestrus near the time of ovulation. The edema consisted of a distention of lymphatic lacunae with plasma. With the event of metrorrhagia plasma was found in the tissue spaces of the lamina propria. Tissue plasma was discharged from the endometrium in considerable quantity. It was expelled from a ruptured epithelial surface in the intercaruncular areas. Plasma also escaped through apparently intact epithelium. Following metrorrhagia very little edema was present.

During early proestrus cytoplasmic disintegration with nuclear pyknosis and karyorrhexis was found in the uterine surface and proximal glandular epithelia. The height of the glandular epithelia increased beginning with estrus, while the surface epithelium decreased in height after this period.

Pronounced capillary distention was observed principally in the caruncular areas after the end of estrus. Microscopic bleeding into the uterus by diapedesis began just prior to ovulation. In the caruncular areas the epithelium remained intact during the massive haemorrhage on the 2nd day postestrus. In the intercaruncular areas many sites of epithelial disruption and direct capillary haemorrhage into the uterine lumen were seen.

Epithelial debris and fragments of lamina propria connective tissue were found in the uterine lumen mixed in the endometrial flow.

Blood pigment found in the surface epithelium and lamina propria during proestrus probably remained from the previous bleeding and was slowly being phagocytized and absorbed.

Mitotic activity began during the first day postestrus prior to ovulation and continued through and beyond the bleeding period. Proliferation of surface and glandular epithelial cells rapidly regenerated the uterine epithelium to an intact state.

Neutrophils and macrophages were observed in a small number in the lamina propria during late proestrus and in the basal regions of the surface epithelium at the end of estrus.

During the 1st and 2nd days postestrus large numbers of neutrophils and to a lesser extent macrophages were observed in the lamina propria and surface epithelium. Following the bleeding stage during the 3rd day postestrus these cells largely disappeared and a slight increase in lymphocytes was noticed in the lamina propria.

MUSSILL, J. (1947.) Follikelhormonwirkung und Anöstrie bei Rindern. [Effect of follicle hormone on bovine anoestrus.]—*Wien. tierärztl. Mschr.* 34, 401-412. 363

M. reports on the use of the following oestrogenic hormone preparations in the treatment of various types of anoestrus in cows:—sexoretin (diethylstilboestrol), retalon (*p*-dihydroxyphenylhexane [hexoestrol?], provetan (semi-synthetic "natural" oestrogen), and tewelhormon (oestrogen from pregnant mares' urine). Injection into non-pregnant cows indicated that the following doses of the various preparations, as judged by their effect on the tone of the uterus, were equivalent: 25 mg. natural oestrogen, 30 mg. sexoretin, and 45 mg. provetan.

Oestrogen therapy had no beneficial effect in the treatment of anoestrus in heifers and in cows after their first calving. In older cows, ovulation and oestrus followed in 22 of 60 cases treated with oestrogen (3-5 ml. sexoretin), 11 of 60 untreated controls also came into oestrus. Of 20 cases treated with retalon aquosum nine came into oestrus; of a similar number of untreated controls, four came into oestrus. Oestrogens were found to be of value in the treatment of persistent corpus luteum; of 20 cows injected with 4 ml. sexoretin or 6 ml. retalon, 16 came into oestrus and ovulated. Of 20 concurrent controls two came into oestrus spontaneously. Sixty-three cases of pyometra were treated, emptying of the uterus and oestrus occurring in 49 of these after 1-3 injections of oestrogen. Abortion resulted from the injection of 10 ml. sexoretin in eight of 14 cows in early pregnancy (3-12 weeks). Oestrogen therapy frequently caused a fall in the milk

yield of treated animals for 1-2 weeks. In cases of acute mastitis injections of 50,000 i.u. oestrogen proved helpful. The necessity of having control animals in studies on the therapeutic value of hormones in the treatment of sterility is stressed.

—ALFRED T. COWIE.

HUTCHINGS, L. M. (1948.) Sterility in swine.—*J. Amer. vet. med. Ass.* 112, 114-119. 364

The author briefly summarizes the published work on sterility and factors affecting fertility in swine. He records some of his own observations on brucellosis and its association with reproductive failure. Eight naturally infected sows over a two-year period farrowed only 14 litters when served for two farrowings per year. Many of the young pigs were still-born and many died during the first few days after birth. Failure to conceive is regarded as a common indication of brucellosis in swine. Metritis and cervicitis are usually seen in such infertile sows.

The semen of infected boars usually contains *Brucella suis*. Unwillingness to serve, decrease of volume of semen and complete sterility have been observed in infected boars. Removal of the affected testicle in two boars which had a unilateral orchitis and were unwilling to serve enabled such boars to be used for breeding again. Whether it would be safe to use such boars in a brucellosis-free herd was not determined.—D. L.

FRAPS, R. M., & NEHER, B. H. (1945.) Interruption of ovulation in the hen by subcutaneously administered non-specific substances.—*Endocrinology*. 37, 407-414. 365

Certain hormone-free substances when suspended in saline and injected subcutaneously in regularly laying hens were found to inhibit or interrupt ovulation causing extensive follicular atresia. Desiccated preparations of bovine corpus luteum and ovarian residues, and of the brain, muscle and oviduct of the chick, dried egg-white, ovalbumen, casein and peptone were effective. In view of the activity of ovalbumen, casein and peptone the action of the preparations is attributed to their content of protein or protein derivatives. Several possible mechanisms of the reaction are discussed and it is considered that either the interruption of ovulation is caused by a suppression of the gonadotropic secretion of the anterior pituitary or that the substances, on reaching the blood stream, adsorb and immobilize the circulating gonadotropins.—A. T. COWIE.

ROTHCHILD, I., & FRAPS, R. M. (1945.) The relation between ovulation frequency and the incidence of follicular atresia following surgical operations in the domestic hen.—*Endocrinology*. 37, 415-480. 366

The relation between ovulation frequency (i.e., ratio of duration of clutch period over length of cycle) and the incidence of follicular atresia following certain operative procedures was studied in hens. The operations were carried out under nembutal anaesthesia and were as follows (1) removal of the youngest ruptured follicle (111 hens), (2) removal of the next older ruptured follicle (51 hens), (3) removal of ruptured follicle older than either of the first two (39 hens), (4) sham ovarian operation (35 hens), (5) sham operation on the right side of the abdomen in which the ovary was not exposed or handled (15 hens), and (6) operation on the breast muscles involving a similar manipulation and destruction of tissue as in abdominal operations (37 hens). In all groups of hens subjected to the abdominal operations, the incidence of atresia was inversely proportional to the frequency of ovulation preceding the operation, ranging from 66.1% among the hens which had shown an ovulation frequency of 0.43-0.60 to 6.4% among those which had shown an ovulation frequency of 0.81-0.93. The induction of atresia was not a specific effect of the removal of the ruptured follicle but was clearly associated with the effect of an abdominal operation. Only in two cases did follicular atresia occur after a breast operation. The relation between incidence of atresia and age, breed, season, position in clutch of oviducal egg at time of operation, time after ovulation that operation was performed, and change in body weight after operation, was investigated. In general, differences in the incidence of atresia in relation to any of these factors could be assigned to primary differences in ovulation frequency, but there was a direct relation between the incidence of atresia and the loss in body weight following operation in birds where the pre-operative ovulation frequencies were similar. The possible role of the pituitary gland in these ovarian changes is discussed and it is thought that delayed ovulation and follicular atresia are qualitatively different responses of the same system.—A. T. COWIE.

STEINBERG, A. G., & FRASER, F. C. (1946.) **The expression and interaction of hereditary factors affecting hair growth in mice: external observations.**—*Canad. J. Res. Sect. D.* 24. 1-9. [Abst. from authors' abst.] 367

Gross observations on the expression of two mutant alleles ("hairless" and "rhino") in the house mouse, and on their interaction with one another and a third mutation ("Naked") producing hypotrichosis of a different type are described. In hairless mice the juvenile pelage falls, the skin shows little wrinkling; rhino mice lose their hair in a similar way but later develop

an intense wrinkling of the skin. Naked mice lose their hair by a breaking-off rather than a falling out, and show a pattern of alternate depilation and regeneration of the hair coat. The variations occurring in hybrids are described and discussed.

FRASER, F. C. (1946.) **The expression and interaction of hereditary factors producing hypotrichosis in the mouse: histology and experimental results.**—*Canad. J. Res. Sect. D.* 24. 10-25. [Author's abstract copied *verbatim*.] 368

The first visible abnormality in the skins of homozygous rhino mice is a hyperkeratosis of the epidermis and follicle neck wall at the time when active growth of the hair ceases. This is associated with a widening of the hair canal (due to a lateral expansion of the hyperplastic layers of the follicle neck) and a subsequent irregular shortening of the follicle. The cause of hair loss is considered to be the widening of the hair canal and consequent lack of the support supplied by the normally tight-fitting follicle neck when shortening of the follicle raises the base of the hair to a level just below the proximal end of the hair canal. The hyperplastic tendencies of the epidermal derivatives are further expressed by (a) the development of hair canal cysts (utriculi), which leads to an increase in the surface area and a consequent wrinkling of the skin, (b) the formation of sebaceous-gland and follicle-end cysts, which cause the thickening of the epidermis, and (c) overgrowth of the nails.

Hairless (*hr hr*) mice show a similar, but less extreme, tendency towards hyperplasia, and the histological character of the skins of hairless/rhino hybrids is intermediate between that of the rhino and hairless types.

Mice of any of these types (*hr hr*, *hr^{rh}hr*, *hr^{rh}hr^{rh}*), which are also heterozygous for the Naked factor, show an exaggeration of both the follicular keratosis and the Naked characteristics. In mice homozygous for the Naked factor the exaggeration is more extreme.

Transplantation experiments show that rhino skin adjacent to normal skin behaves non-autonomously, indicating that rhino skin cells are able to utilize but cannot produce some substance necessary for the maintenance of normal stratified squamous epithelium; this substance is produced by normal skin cells but is not present in the blood stream of normal mice.

Results of an attempt to discover a relationship between the mode of action of the rhino mutation and the metabolism of vitamin A by feeding rhino mice massive doses of vitamin A were inconclusive.

BUTLER, L. (1947.) **The genetics of the colour phases of the red fox in the Mackenzie River locality.**—*Canad. J. Res. Sect. D.* **25.** 190-215. **369**

The red fox (*Vulpes fulva*) exists in the wild in three colour phases: red, cross and silver or black. All result from a single pair of alleles, the homozygotes being silver and red and the heterozygote being cross. Two mutations have occurred giving rise to the Canadian gene in eastern Canada and the Alaskan gene in western Canada.

The proportions of the colour phases vary with locality, state of population cycle, population trend and migration pressure. The importance of the four factors is discussed. Diminution in the percentage silver and cross is attributed to rapid population increase in an area of low-frequency of the silver producing gene and migration of this type into areas of higher frequency.—P. J. G. PLUMMER.

PUTNAM, D. N., & HENDERSON, H. O. (1946.) **The effect of pregnancy on the body weight of dairy cows.**—*J. Dairy Sci.* **29.** 657-661. **370**

The effect of pregnancy on body weight was investigated in 56 normal Ayrshire cows during the first three periods of gestation. The average

age at first calving was 32 months, 46 months at the second and 59 months at the third. The gain in weight was faster and more uniform in the first gestation, approximately 50% of the gain in weight being made in the first five months. In the second and third pregnancies gains of only 29% and 27% respectively were made over that period. Analysis of the data showed that approximately 50% of the total weight gain of first calf heifers could be attributed to permanent growth, the other 50% being due to the products of conception. In the second and third pregnancies permanent growth accounted for only 27% and 20% respectively of the total weight gain.

—ALFRED T. COWIE.

VEIGA, J. S., CHIEFFI, A., & PAIVA, O. M. (1946.) **Duração do período de gestação em fêmeas da raça nelore e idade na época da primeira cria. [Gestation period and age at the first calf in Nellore cows (Ongole breed).]**—*Rev. Fac. Med. vet. S. Paulo.* **3.** No. 3. 55-59. [English summary.] **371**

Nellore cows on one farm in Sao Paulo have an average gestation of 291.4 ± 0.50 days. Heifers are covered after 24 months of age. Average age for first calving is 40 months 19 days.—I. W. J.

See also absts. 186 (spirillary abortion); 344 (function of uterus and corpus luteum); 345 (metabolism of spermatozoa); 387 (stock breeding and artificial insemination—a text-book).

ZOOTECNHY

RHOAD, A. O. (1944.) **El clima y la producción ganadera. [Climate and livestock.]**—*Rev. Agric. Costa Rica.* **16.** 43, 45-47 & 49-51. **372**

R. discusses the effects of temperature, rainfall and sunshine on the growth and productive abilities of the domestic animals and birds. He stresses the value of cross-breeding in adapting animals imported from Europe to the climatic conditions prevailing in subtropical and tropical countries.—I. W. JENNINGS.

SMITH, V. R., & PETERSEN, W. E. (1946.) **The effect of increasing the negative pressure and widening of the vacuum-release ratio on the rate of removal of milk from the udder.**—*J. Dairy Sci.* **29.** 45-53. **373**

The effects of increasing the negative pressures and widening the pulsation ratios upon the rates of milk flow and the completeness of milking were studied in 12 cows. Three sets of experiments were carried out. In the first, the rate of milk withdrawal during one min. at the height of milking was established for each quarter at negative pressures of 10, 12.5 and 15 in. Hg. and pulsation ratios of 1:1 and 1:3. In the second experiment the rate of milk withdrawal for the whole udder for the first three min. of milking

was determined at negative pressures of 10, 12, 14 and 16 in. Hg. and at pulsation ratios of 1:1 and 3:1. In the third experiment, a procedure similar to that in the second was followed except that the readings were taken to the "end-point" of milking (*i.e.*, until three successive scale readings were 0.3 lb. or less) and pulsation ratios of 1:1 and 2:1 were employed.

In general, each increment in negative pressure increased the rate of milk withdrawal but not at a uniform rate for all cows. Widening the pulsation ratios increased the rate of milk withdrawal but not in proportion to the increased time of vacuum application. The effect of increasing the negative pressure and widening the pulsation ratios on the completeness of milking were variable. Each increment of negative pressure up to and including 14 in. Hg. effected a more complete emptying of the gland. The less complete emptying noted at 16 in. Hg. may have been due to the greater tendency of the cups to crawl up the teats and partially obstruct the passageways. While it is possible to obtain faster milking by increasing the negative pressure and/or widening the pulsation ratios, there is a limit to which these factors can be altered, without injury to the teat and udder.—ALFRED T. COWIE.

DUNCAN, J. E. (1945.) **A new method of dipping sheep. Australian power-spray system tested in N.Z.**—*N.Z. J. Agric.* 71. 341-348. 374

A power spray unit of Australian design is described and illustrated. It consists of a pen in which the sheep are sprayed, draining pens, a sump from which the fluid circulates and a centrifugal pump driven by a five-horse-power electric motor.

A unit of this type holding about 50 Romney ewes was installed and tested at Ruakura Animal Research Station. The wetting and penetrating power was observed by placing small quantities of dry powdered methyl violet on the skin at selected points before the sheep were sprayed. The results indicated that with Crossbred (Romney) sheep carrying three and a half months' fleece, adequate wetting occurred when upper and lower sets of nozzles were on separately for two minutes each.

Approximately 500 sheep per hour could be sprayed.

The advantages and disadvantages of power spraying are discussed.—L. K. WHITTEN.

EWER, T. K., & HANCOCK, J. J. (1946.) **The Mowat tailer. Reports on departmental trials.**—*N.Z. J. Agric.* 72. 17-18. 375

The Mowat lamb tailer, which was claimed by the inventor to minimize bleeding, reduce lamb losses and increase the rate of fattening, was compared with the knife using some 800 lambs on two Government farms. The instrument is designed to cut the tail and at the same time clamp the end of the stump to check haemorrhage. The Mowat instrument was slower than the knife: the amount of bleeding was less with the former. Losses with either method were negligible. There were no significant differences in the growth rates, percentage fattened before weaning or carcass grades between the two groups.

—L. K. WHITTEN.

ELLS, J. B., & MORRIS, L. (1947.) **Factors involved in hatching chicken and turkey eggs at high elevations. A progress report of the first year of work on the effect of additional oxygen upon embryonic growth and mortality.**—*Poult. Sci.* 26. 635-638. 376

Experiments are described at Laramie, Wyoming (elevation 7,200 ft.) on the addition of oxygen to the incubator during incubation. Hatchability of hen's eggs was thereby increased by about 18%. Oxygen supplied during the first and third weeks only was nearly as effective as oxygen over the whole period but the addition of oxygen for one week had little effect. One experiment with turkey eggs gave 66.7% hatchability as compared with 27.5% in the controls.

The authors concluded that poor hatchability at high altitudes is due to oxygen starvation.

—D. LUKE.

TEMPERTON, H., & DUDLEY, F. J. (1948.) **The reactions of baby chicks to chilling and over-heating.**—*Harper Adams Util. Poult. J.* 33. 8-16. 377

Experiments are described in which separate lots of chicks were chilled and over-heated under conditions which simulated those likely to be met with during normal transit from hatcheries. Adequate controls not subjected to temperature variations were kept in all cases.

The chilling was carried out overnight for the 12-hour period 6 p.m. to 6 a.m. and the over-heating experiments were carried out from 10 a.m. to 10 p.m. In two chilling experiments minimum temperatures of 52° and 44°F. were recorded. The chilled chicks tended to huddle together but in the 12-hour period after exposure only two died out of 200 in one experiment, and there were no deaths among 400 chicks in the second experiment. A rectal temperature depression of up to 4°F. was recorded among the chilled chicks.

Chicks exposed to temperatures up to 110°-112°F. showed a 16% mortality during the 12-hour period after exposure. Such chicks were visibly distressed and respirations were very rapid. Rectal temperatures of nearly 9°F. higher than the controls were recorded.

Groups of these chicks were subsequently kept for 14 days in brooders: at high temperatures (mean 106°-107°), medium temperatures (mean 90°-93°) and low temperatures (mean 76°-77°). In the chicks previously overheated the brooder temperature did not appear to influence mortality and effect of the brooder temperature on the previously chilled chicks was not consistent. The death rate among the controls in some of these experiments was abnormally high, *i.e.*, up to 20% for the first 14 days in the brooder and the authors admit that factors other than those under investigation may have influenced the result.

One of the purposes of the experiment was to provide material for the P.M. study of lesions as a result of the chilling and over heating. This aspect of the work is to form the subject of a separate report to be published elsewhere.—D. L.

HARR, J. F. (1943.) **Factors influencing poult mortality.**—*Bull. Calif. Dep. Agric.* 32. 96-99. 378

A general article stressing some of the more important points of general management of young turkeys. No new or even detailed information is given.—J. D. BLAXLAND.

HARR, J. F. (1944.) **Important factors in raising healthy turkeys.**—*Bull. Calif. Dep. Agric.* 33. 174-180. 379

A review of some of the more important factors, directly or indirectly influencing the health

of turkey flocks. H. discusses briefly hereditary factors, incubation and hatching, equipment, rearing and general management, and other environmental factors such as climatic conditions and the nature of the soil.—J. D. BLAXLAND.

See also absts. 386 (a dictionary of genetics); 387 (stockbreeding and artificial insemination).

TECHNIQUE AND APPARATUS

TINEL, J. (1947.) **Technique d'imprégnation argentique des fibres nerveuses sur coupes à la paraffine. [Silver impregnation of nerve fibres in paraffin sections.]**—*C.R. Soc. Biol. Paris.* 141. 698-700. 380

An adaption of the Bielschowski - Gros method. Paraffin sections are made and fixed to the slide in the usual way. The original method is then followed exactly, but between each stage the sections are dried with filter paper.

For particularly detailed results, T. gives further modifications of the method.—L. M. M.

WIENER, M. J., & SHAPIRO, S. (1947.) **Fibrin appearance time. A rotating tube method for estimating the clotting time of the blood.**—*J. Lab. clin. Med.* 32. 1037-1041. 381

With the usual methods the estimation of blood clotting time is only approximate. The authors use a transparent tube rotating slowly at constant speed. Unmodified blood (0.5 ml.) is introduced into the bulbous end and the motor started. The appearance of a continuous mass of fibrin clinging to the circulating wall, is the end point.—L. M. MARKSON.

BOOK REVIEWS

SERGEANT, Ed., DONATIEN, A., PARROT, L., & LESTOQUARD, F. (1945.) **Études sur les piroplasmoses bovines. [Studies of bovine piroplasmosis.]** pp. 816. 324 figs. Algiers: Institut Pasteur d'Algérie. 4to. 382

This interesting book is not a general review of the subject of bovine piroplasmosis, but records the results of the study of tick-borne diseases of cattle (piroplasmosis, theileriasis and anaplasmosis) in North Africa over a period of 30 years. During this time five bovine infections due to these parasites have been shown to occur, their differential characteristics and their relationship to similar organisms from other areas have been studied, their arthropod vectors determined and successful methods of immunization introduced. The five bovine parasites are described under the names *Piroplasma bigeminum* [*Babesia bigemina*], *Babesiella berbera* [*Babesia argentina*], *Theileria dispar* [*T. annulata*], *T. mutans* and *Anaplasma marginale*. The name *T. annulata* is rejected on the ground that the parasite described by SsCHUNKOWSKY & LUHS in 1904 was a mixed infection of a theileria and an anaplasma. Further, although it is admitted that *B. argentina* and *B. berbera* are morphologically indistinguishable, they do not give cross-immunity. [Similar immunological differences occur between strains of *B. canis* from different areas.]

Part I of the book defines the parasites concerned, gives a description of the cycle of develop-

ment of the various species, and of the ticks which transmit them. The differentiation of species of ticks is very fully dealt with.

Part II describes the technique used in the study of the infections, the methods of keeping animals tick-free, the methods of isolating pure infections of individual organisms, and the methods of comparing reactions in groups of animals by the use of "crisigrams". A crisigram is obtained by plotting the mean of the maximum numbers of parasites found in each member of a group (per 1,000 red corpuscles) along the vertical axis and the mean of the totals of maximum temperatures noted during days of fever in the same group along the horizontal axis, a curve then being drawn connecting the corresponding points relating to each group of animals. The principal experimental evidence on which conclusions are based is quoted. Of particular interest in this section are the records of the incubation periods observed after inoculation, the length of time infection persists in a recovered animal, the effect of rapid or delayed passage on the virulence of strains and the length of time during which shed blood remains infective. Notes on chemotherapy are also given.

Part III discusses tick destruction; a few notes are given on the use of D.D.T., but it is doubtful whether its protective action is sufficiently prolonged to make it of much value. Details of the methods of vaccination are also given. A

grave danger in immunization is the complication of the vaccine reaction with a concurrent serious *Anaplasma* infection, although this can be avoided by combining *A. centrale* with the babesial or theilerial vaccine to be used.

Part IV is devoted to certain questions of comparative pathology, and includes notes on the differential morphology of the various parasites, variations in virulence within a species and other epidemiological considerations encountered during the investigations. A section in this part headed "pathologie générale" is devoted to a discussion of acute and chronic parasitism and the terms "latent infection" and "premunition".

—U. F. RICHARDSON.

FEARON, W. R. [M.A., Sc.D., M.B.; Professor of Biochemistry, University of Dublin]. (1947.) **An introduction to biochemistry.** pp. x+569. London: William Heinemann Medical Books. 3rd Edit. reprinted. 21s. 383

This well-known book, now in a reprint of its third edition, was primarily written for medical students, but has proved to be of great value to a far wider range of readers including research workers in many branches of science cognate to medicine. Every chapter has been revised in the light of more recent knowledge and many new sections have been added. Until recently there has been a tendency for writers of books on biochemistry to confine themselves to the older type of knowledge of physiological chemistry, but the author, whilst not neglecting the earlier pattern of physiological chemistry, has introduced topics of more dynamic biochemistry in chapters on tissue chemistry and respiration, and has included a good deal of modern information on intermediary metabolism and hormones and a useful chapter on nutrients.

The book is broadly divided into two parts: elements and inorganic compounds; and organic biochemistry. The general pattern of the text follows conventional lines, but the treatment is concise, thorough and to the point, the facts of each aspect of the story being told in a minimum of words, but this has in no sense detracted from the style which is a model of lucidity. In response to demands the author has included a bibliography of references at the end of each chapter, and in the text indications are given of the authors and dates of publication of particular papers so that the originals may readily be traced in standard sources of information.

The book has been well received in the past, and it is certainly one that should be readily available to all biochemists and others interested in problems of physiology and nutrition concerning health and disease.—A. EDEN.

MENSA, A. [Director of Veterinary surgery at the University of Bologna]. (1947.) *Patologia chirurgica veterinaria*. I. Chirurgia generale e sistematica. II. Chirurgia speciale e regionale. [Veterinary surgical pathology. I. General and systematic surgery. II. Specialized and regional surgery.] I. pp. xxiv+834. II. pp. lii+1279. Torino: Unione Tipografica—Editrice Torinese. [2nd Edit.] Numerous figs., some coloured. 384

The author presents the second edition of his Veterinary Surgical Pathology, 10 years after the publication of the first edition. There is no substantial modification in this new work apart from the addition of a section on animal streptothricoses and the insertion throughout of some references to new work by various authors. Some of the photographs are still very poor in quality, but the diagrams are always clear and helpful.

The book is in two volumes, the first dealing with general and systematic surgical pathology, the second with special and regional aspects of the subject. Features of the first volume are the attention paid to definition of medical terms and the clear exposition of pathological processes, without too much fundamental detail, which can be more suitably acquired in textbooks on biochemistry, bacteriology, etc. It is refreshing to find good descriptions of subjects which are somewhat neglected in this country, such as (true) tuberculosis of the skin, streptococcal erysipelas, the problem of pain, and animal psychoses. In the second volume, special surgery is dealt with mainly by describing the morbid conditions and their incidence in the various animals, followed by an outline of the methods of diagnosis and the prognosis. Surgical intervention and other methods of cure are outlined in general terms only. Under the heading of regional surgery, the author gives a list of the pathological conditions to be found in each region.

This textbook will be useful to students and to practitioners in their everyday work, while those who require more detailed knowledge will be aided by the copious lists of references at the end of each chapter.

Although allowances must be made for the difficulties of the last few years, it must be admitted that the author has not taken full advantage of the opportunity of bringing his book completely up to date.—I. W. JENNINGS.

FOLLIS, R. H., Jr. [M.D.; Associate Professor of Pathology, Duke University School of Medicine, Durham, North Carolina]. (1948.) **The pathology of nutritional disease. Physiological and morphological changes which result from deficiencies of the essential elements, amino**

acids, vitamins, and fatty acids. pp. xii+291. Numerous figs., 8 tables. Oxford: Blackwell Scientific Publications Ltd. 35s. 385

It may be said at once that the appearance of a book devoted to the pathology of nutritional diseases is to be heartily welcomed since the subject is one that has become very confused. In order to bring some order out of the chaos, the author has confined himself to mammalia and has dealt individually with the various essential substances so that the result of a lack of any one of them can be the more clearly described. Since, however, in practice nutritional deficiency is seldom limited to one substance only, there is here, perhaps, the danger of over-simplification.

After a short introduction containing some timely observations on the conduct of nutritional experiments and the recognition of specific and non-specific changes due to diet, the various substances are dealt with separately, grouped under the headings of essential elements, essential amino-acids, vitamins and essential fatty acids; the pathological anatomy of specific tissues is also discussed. The same pattern is adopted in the treatment of each substance. After a brief historical note, the biochemical relationships, pathological effects and the effect of deficiency in man are described.

Although the book is primarily intended for human pathologists, it is also of importance to veterinary readers since so much of the material refers to nutritional deficiencies in animals. Indeed, for all those engaged in the study of animal nutrition, it may be said to be an essential addition to their bookshelves.

The book is well presented and illustrated with excellent photo-micrographs but there are some obvious typographical errors which it is to be hoped will be corrected in a future edition.

—J. A. NICHOLSON.

KNIGHT, R. L. [D.Sc., Ph.D., A.I.C.T.A.; Senior Economic Geneticist, Empire Cotton Growing Corporation and Sudan Government]. (1948.) **Dictionary of genetics. Including terms used in cytology, animal breeding and evolution.** pp. ix+188. Waltham, Mass.: Chronica Botanica Co. London: Wm. Dawson & Sons, Ltd. \$4.50. 386

The rapid development of genetical knowledge and the consequent growth of its vocabulary makes it increasingly difficult for the non-specialist reader to follow the literature intelligently.

This dictionary, which covers the terms used in cytology, animal breeding and evolution, will be welcomed by many and may do something to

prevent the coining of new and unnecessary words where suitable terms already exist.—M. C.

MILOVANOV, V. K., & SOKOLOVSKAYA, I. I. Translated by MORTON, A. G. [B.Sc., Ph.D.]. (No date.) **Stockbreeding and the artificial insemination of livestock.** pp. 160. London: Hutchinson's Scientific and Technical Publications. 38 illus. 25s. 387

This is a translation from the Russian, but unfortunately the date of publication of the original Russian work is not given; internal evidence would suggest that it is some years old. Of the 140 pages of text only 20 are devoted to the technique of artificial insemination. Dealing with cattle it is stated that only 12 cows should be inseminated from one ejaculate and that as fertilization is only possible when the ripe ovum is in the oviduct, the cow can only usefully be inseminated when in oestrus. Some of the methods advised appear to be rather crude, for example artificial vaginas are lubricated by melted butter, lard or flour paste. Intrauterine insemination of cows is mentioned but is said to be too complicated and difficult to be practicable.

The remainder of the book deals with improvement of breeds of livestock, the teaching of Darwin being taken as the guide.

Mendel's work is ignored.—F. L. M. D.

BARTLEY, S. H. [Ph.D.; Professor of Research in the Visual Sciences, Dartmouth Eye Institute, Dartmouth Medical School], & **CHUTE, E.** [M.A.; Research Associate in the Visual Sciences, Dartmouth Eye Institute, Dartmouth Medical School]. (1947.) **Fatigue and impairment in man.** pp. ix+429. 60 figs. Numerous refs. New York & London: McGraw-Hill Book Company, Inc. 33s. 388

In spite of the fact that fatigue is a common experience, little attempt has been made to elucidate its origin or even to define what it is. The concept that fatigue results from the expenditure of energy has held the field with physiologists who have studied the physico-chemical changes and impairment of function arising in some organ such as muscle or nerve from overwork, but up to the present a study of fatigue from the point of view of the individual as a whole has not been undertaken.

In this book, the authors examine the question from many angles and give a clear picture of the underlying causes of fatigue, *i.e.*, the sensation of feeling tired. Whilst the observations apply almost entirely to human beings, the veterinary reader will find much of interest in the approach to the subject which may be of assistance in the study of animal behaviour.—J. A. N.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education and other aspects of veterinary science.

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